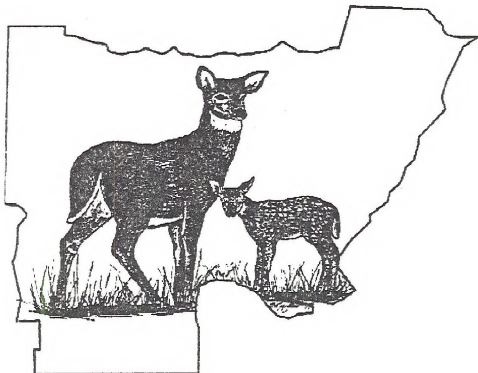




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North Bank Habitat Management Area/ACEC

Draft Environmental Impact Statement



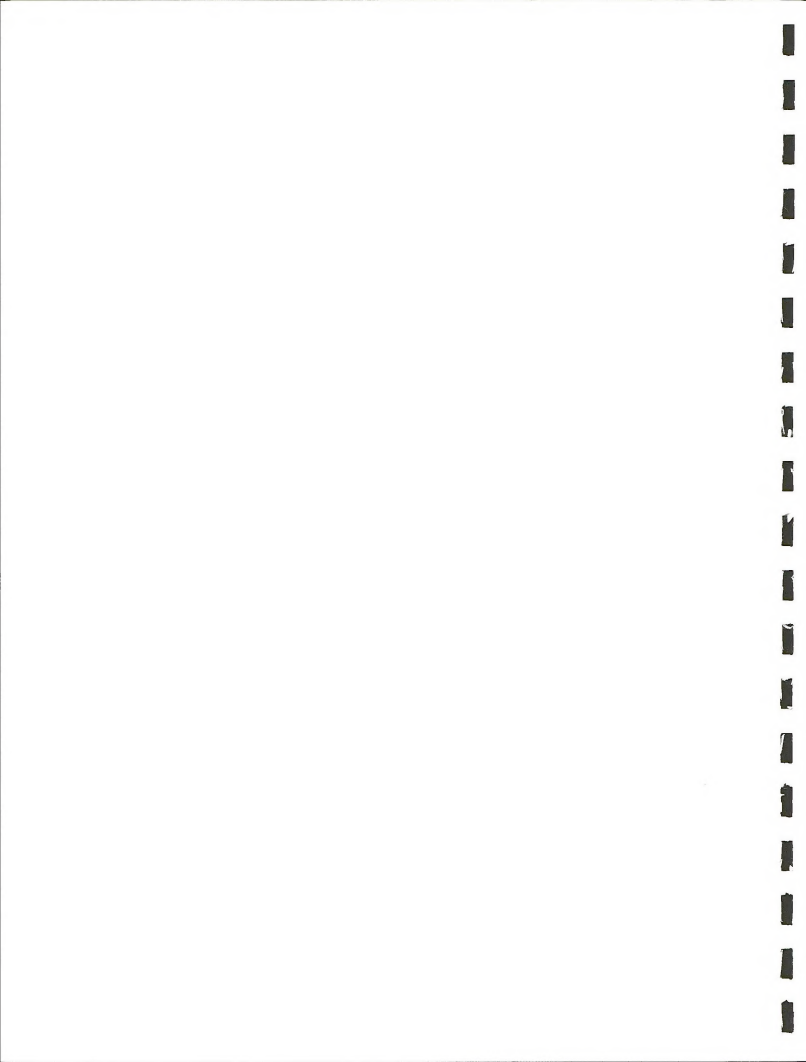
December 1999

U.S. Department of Interior
Bureau of Land Management

Roseburg, Oregon
777 NW Garden Valley Blvd
Roseburg, Oregon 97470

In Cooperation with:
U.S. Fish and Wildlife Service
Oregon Dept. of Fish and Wildlife





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Chapter One

Purpose and Need for Action

Introduction

The 6,581 acre North Bank Habitat Management Area (NBHMA) was acquired by the Bureau of Land Management (BLM) in 1994. The area is located northeast of Roseburg, Oregon (Figure 1), and is on the north side of the North Umpqua River across from Whistler's Bend Park. Portions of the southern boundary extend to County Road 200 (North Bank Road) (Figure 2). The NBHMA was obtained through a land exchange to secure habitat for the federally endangered Columbian white-tailed deer (CWTD), *Odocoileus virginianus leucurus* (Environmental Assessment for Proposed Dunning Ranch Exchange [hereafter referred to as Exchange EA], 1993, page 1). The ranch property was obtained through exchange of 360 acres of O&C (Oregon and California Railroad revested) lands. As a consequence, all trade lands received by BLM must be classified as O&C. Due to the area's value as habitat for CWTD and other sensitive species, 6221 acres were designated as an Area of Critical Environmental Concern (ACEC) (Roseburg District Resources Management Plan [RMP], page. 89) with the remaining acres to be managed for timber production (Decision Record, Exchange EA, 1993, page V).

The CWTD is one of approximately 30 subspecies of white-tailed deer found in North America (Bailey, 1936). The CWTD is the western-most population of white-tailed deer and is genetically isolated from other subspecies. Formerly, CWTD occupied the Umpqua and Willamette valleys and the Lower Columbia River north to the Cowlitz River bottoms in Washington (Bailey, 1936). Currently, two remnant populations of the CWTD persist: one in the floodplain of the Lower Columbia River and the Roseburg population within the Umpqua Basin of Douglas County (Revised Recovery Plan, USFWS, 1983). The species was federally listed as endangered in 1967 when the Columbia River population was estimated at 300 to 400 animals and the population was threatened by continuing habitat destruction in riparian areas (Endangered and Threatened Wildlife and Plants, USFWS, 1994). Oregon listed the species as endangered in 1975 (Marshall et al., 1996).

According to the 1983 Revised CWTD Recovery Plan, the Roseburg population would meet recovery objectives for delisting when the species has a minimum viable population of 500 deer distributed within a minimum of 5,500 acres of secure habitat. "Secure" is defined as, "suitable habitat within the Umpqua Basin of Douglas County on lands owned, controlled, protected or otherwise dedicated to the conservation of the CWTD." Current estimates of the Roseburg population state that the number of CWTD exceeds 5,000 animals (Watershed Analysis [WA] of the North Bank Watershed Analysis Unit (Oregon Department of Fish and Wildlife (ODFW) data, 1997, page 4-5). The NBHMA provides habitat for an estimated 200 to 350 CWTD and approximately 550 to 640 CWTD reside on secure habitat in the Umpqua Basin (Recovery Team Memo, S. Denney, June 3, 1997). Since acquisition of the NBHMA in 1994 and the Roseburg population meeting recovery objectives, the state downlisted the CWTD from endangered to sensitive (1995 November ODFW Commission Meeting). Further, the Federal objectives for delisting have been met. The U.S. Fish and Wildlife Service has proposed delisting on May 11, 1999 (Federal Register, May 11, 1999 (volume 64, number 90 page 25263-25269)). The review process may take up to a year before a final decision is made. If the CWTD is delisted, maintaining secure habitat would continue to be a high priority.

Need for Action

Despite the apparent population increase and the acquisition of secure habitat, several factors could still jeopardize the Roseburg population of CWTD. Reproduction is very low (Kistner and Denney, 1990, page 6), and fawn survival during the first month of life

Figure 1 North Bank Habitat Management Area Vicinity Map

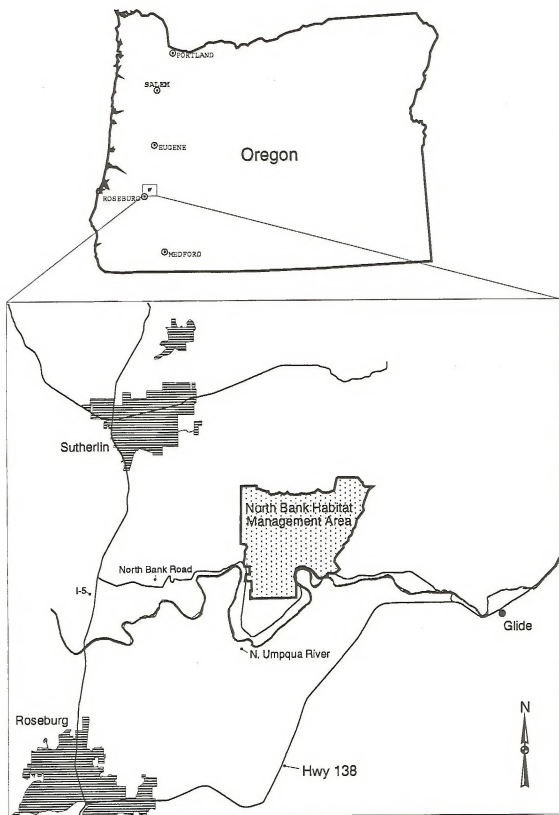
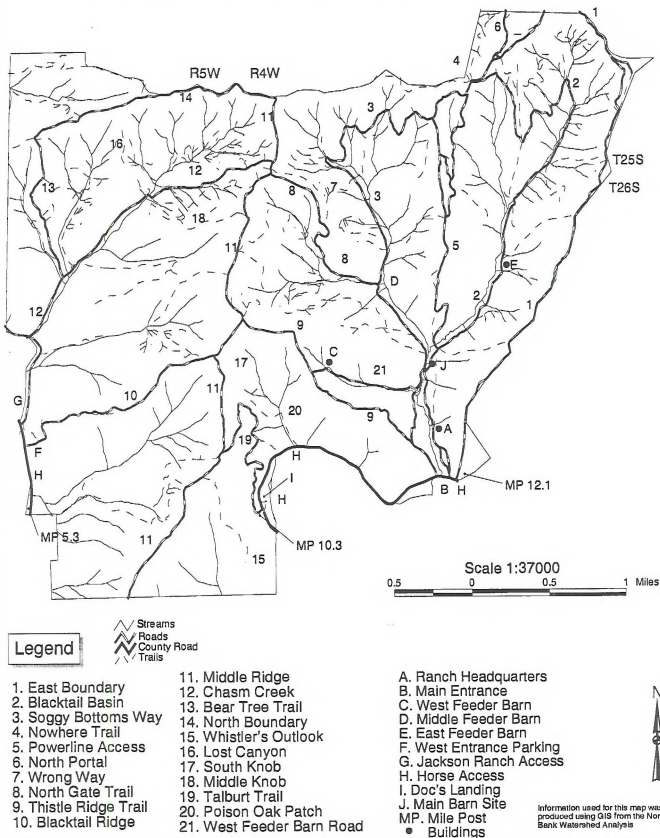


Figure 2

North Bank Habitat Management Area Map



is less than 50% (Ricca and Jackson, ODFW, 1996 & 1997 field work). Given the genetic isolation of the CWTD and low recruitment rates (reproduction plus fawn survival), it is uncertain how quickly the population would recover from a significant loss caused by disease, weather or other calamity. The BLM has clear responsibility under the Endangered Species Act to manage the NBHMA in a manner which will not result in the "take" (see glossary) of Columbian White-tailed Deer. Wildlife professionals from the BLM, Oregon Department of Fish and Wildlife and USDA Animal Health Services have all noted that the deer on the NBHMA are in a poor nutritional state and that the most likely cause is poor habitat conditions (i.e. a lack of adequate forage). Natural succession of vegetation could make habitat on the NBHMA less suitable for CWTD and other species of special concern. This presents two options for management. The first is to reduce the density of deer to a point where herd condition improves. The second is to improve the habitat in order to provide more quality food for the deer. Because of the legal status of the CWTD and the need to continue the specie's recovery, rather than reduce populations, the first option is not viable at this time. The second option, habitat improvement, provides the only practical means for improving the health of the deer herd by increasing quality and quantity of forage on the NBHMA.

The BLM proposes to develop an Environmental Impact Statement (EIS) and Habitat Management Plan (HMP) to implement the necessary management techniques on the NBHMA that would enhance habitat for CWTD as well as other species of special concern. If an EIS/HMP would not be developed, the ranch would continue to be managed as described by the "No Action" alternative.

The NBHMA also provides unique opportunities for recreation activities. The BLM proposes to accommodate compatible recreational use and some limited facilities.

The Exchange EA specified that timber management would be accomplished on 400 acres (Decision Record, Exchange EA, 1993, page V). This EIS will identify those areas and establish management guidelines.

The management alternative selected from those outlined in Chapter Two will provide the BLM guidance for managing the NBHMA for the next 10 years. The Habitat Management Plan (HMP) identifies specific projects analyzed under the Proposed Action Alternative that would be pursued as funding and personnel become available.

The NBHMA Interdisciplinary Team (ID Team) identified two broad goals:

Primary Goal: Ensure that habitat for the CWTD and special status species is managed to maintain species viability over time.

Secondary Goal: Accommodate other uses that are compatible with the primary management goal.

Background and Scoping Summary

Original scoping for the Dunning Ranch/NBHMA began in 1993 with a *Federal Register* notice announcing a plan amendment and land exchange (*Federal Register*, March 19, 1993, page 15160 to 15161). Legal notices were also published in the local Roseburg newspaper (*The News Review*, March 19, 26, and April 2, 1993). The BLM mailed a news release on March 18, 1993, to local media sources, environmental groups and timber industries. A few days later, the land exchange was a front page story (*The News Review*, March 21, 1993). Letters announcing the exchange were also sent to 56 adjacent landowners. A draft land exchange EA and Finding of No Significant Impact (FONSI) were completed later that year (*Federal Register*, September 1, 1993; *The News Review*,

Legal Notices, September 8, 1993) and distributed via a mailing list. The final EA was prepared and announced in November (*Federal Register*, November 12, 1993; *The News Review*, Legal Notices, November 12, 1993). The exchange was completed in 1994.

Scoping for the HMP and EA commenced with a series of open houses held by the NBHMA coordinator in 1996 (September 19, 26, October 3, November 9, November 14, 19, 1996). Meetings were announced by direct mailings and contact with adjacent landowners. The November 14 meeting was announced via a BLM news release to the local media on November 8, 1996. A total of 77 people signed the guest register during the open houses. Attendees expressed concerns that revolved around safety issues, types of allowable recreation, potential access sites, availability of water and management of the deer herd.

On October 25, 1996, a project initiation letter was signed that began the development of an EA and HMP for the NBHMA. The ID Team included members of other agencies to facilitate consultation with the United States Fish and Wildlife Service (USFWS) and wildlife management and research with the Oregon Department of Fish and Wildlife (ODFW). This interdisciplinary / interagency team met from November 1996 through August 1997. A Decision Record was signed on February 24, 1998. All planning records, open house comments and ID meeting minutes are on file at the Roseburg District Office and are available for public review.

The NBHMA EA/HMP was subsequently appealed by Umpqua Watersheds on March 19, 1998. A case file was prepared for review by the Interior Board of Land Appeals (IBLA). BLM made, and was granted, a request to remand the decision back to the District in order to reanalyze as an EIS (May 5, 1998). On January 21, 1999, this project was reinitiated as an EIS. A notice was placed in the *Federal Register* on February 4, 1999, that opened a thirty-day public scoping period.

Based on public comments on the original EA, as well as the EIS and discussions within the ID Team, the following items are identified as key issues:

- * CWTD and Special Status Species (plant and animal)
- * Recreational Use and Facility Development
- * Water Quality and Quantity
- * Riparian / Wetland Habitat

With the exception of water quality and recreation resources, items considered and dropped from analysis are the same as the Exhibit A, Tables I and II (Exchange EA, 1993). Specific actions considered and dropped due to incompatibility with the primary goal of the area included development of motorized recreation, remote control airstrip, shooting events, and a campground (ID Team Meeting, January 9, 1997). Since limited entry hunting was not found to conflict with the primary goal, a proposal to prohibit hunting was dropped.

The NBHMA EA addressed "Adjacent Landowners" as a key issue with concerns over how trespass and safety problems (primarily hunting) would be handled. This was not considered as a key issue in this EIS because after five years of federal ownership, the management of the ranch has not had major impacts to the adjacent landowners.

The management alternatives of this document were developed to consider the above key issues. Following the release of this draft plan and EIS, a public comment period will be established and announced to allow document review and additional comments. Input will be used to help finalize the document for implementation.

Key Issues

Four key issues were identified by the public scoping process and the interdisciplinary / interagency team. Major questions regarding each of the issues are presented in *italics*. Background information explaining the issue relative to the question is then presented. In Chapter Two, three management alternatives, which describe individual management actions pertinent to the key issues, are outlined.

1. Columbian White-tailed Deer and Special Status Species

- *How will habitat be managed for CWTD and other special status species?*
Habitat management can be used to enhance forage quality and/or quantity to increase deer survival and reproduction. Habitat management can also be used to help disperse the deer across the property. This would reduce population concentrations in preferred sites. Concentrations of deer tend to stress the deer population because of competition for food and cover or spread of disease. Although some research has been done on the Roseburg population (Gavin, 1979; Smith, 1981; and Kistner and Denney, 1990), relatively little is known about the life history parameters, current population dynamics or specific habitat use and needs of CWTD. Research is in progress on the property to study habitat use, movements, reproduction and survival, and competition with Columbian Black-tailed deer (*Odocoileus hemionus columbianus*) (CBTD). Since results are not yet available, this plan includes management options for all habitat types on the property. Once combinations of habitat and preferred seral stages are known, the chosen alternative can be refined to focus on management actions most beneficial for CWTD.

Since the acquisition of the NBHMA, cattle have been excluded and the use of prescribed fire has been discontinued. Without grazing and fire, natural succession would be expected to progress and cause loss of habitat favorable to CWTD. Natural succession would gradually result in loss of grasslands by encroachment of shrubs, hardwoods and conifers; loss of oak savanna as the lower layer fills with shrubs; and conversion of some oak woodlands to mixed or nearly solid conifer stands. Earlier studies indicate that oak woodlands/grasslands are important habitat for the Roseburg population of CWTD (Smith, 1981), consequently, it is likely that management to prevent the loss of oak woodlands, oak savannas and grasslands on the property would be beneficial. Management could include the selective reintroduction of grazing (cattle), prescribed fire, shrub removal and weed control in selected areas.

- *How will other special status species be impacted?*
In addition to CWTD, there are 11 special status plants species (Table 3-3) and 34 animal species of special management concern (Appendix 1). The value of the NBHMA to these species was an important consideration in designating the property as an ACEC. These species have differing ecological needs and occupy a variety of habitats on the NBHMA. Negative impacts on these species may be reduced by mapping their presence, avoiding developments in critical habitat areas, conducting vegetative manipulations during dormant periods, creating buffer areas around sensitive sites, and conducting research to better understand the needs of these species. Some travel restrictions or area closures may be necessary to protect sensitive sites or species. A decision would be necessary to balance recreational opportunities and vegetative management regimes with the needs of special status species.

- *How will recreational activities or developments affect the CWTB and other Special Status species?*

Increasing the number of visitors to the NBHMA could have a negative impact on CWTB. High amounts of human activity in areas where deer forage, seek cover or fawn could lower deer survival or fitness. This could occur if feeding and resting periods are disrupted. In particular, lactating females forced to continually avoid human contact may be less successful at rearing their fawns.

Deer disturbance can be controlled by seasonally or completely closing sensitive areas, restricting cross-country travel and establishing alternative trails to avoid passage through sensitive areas. Human activity can also be limited by the number of facilities available, the number of people accommodated by a facility and permissible activities. Regulations guiding human activity would be implemented and updated as necessary.

2. Recreational Use and Facility Development

- *Which recreation uses are considered compatible with the primary goal?*

Non-motorized recreational uses such as hiking, mountain biking, wildlife observation, horseback riding, primitive camping, environmental education, hunting or other uses of a similar nature are considered to be compatible with the primary goal when sufficiently mitigated with the Project Design Features described in Chapter Two.

- *How restrictive will use of the NBHMA be?*

Use restrictions would be necessary to protect primary natural resources, promote user safety and minimize user conflicts. This could be accomplished through a variety of ways: regulations on the number or type of users and facilities, where and when activities would be allowed; implementing permits, registration, or use fees, etc. Some restrictions have already been established through the interim management plans in the Exchange EA (page. 3) such as non-motorized use (*Federal Register*, September 9, 1994) and restricting firearm use to legal hunting.

Too many restrictions or inadequate control measures could have a negative effect on the resources. These become confusing to the public, difficult for BLM to enforce and could discourage or anger public users. Having no restrictions could result in impacts to roads, trails, water quality, high disturbance of special status species, and safety or sanitation problems. Each management alternative specifies certain types of restrictions that could be implemented. Over the past five years, recreation use has been minimal (i.e., 0 to 75 people in the area on any given weekend); therefore, the total impact of users on natural resources is not well known. Future restrictions may need to be modified to achieve the primary goal of the NBHMA.

- *What types of public facilities will be provided at the NBHMA?*

Facility development enhances the quality of recreational experiences that public users desire. Developments help promote public safety, provide needed access and reduce undesirable impacts. Facilities may be designed to control the number of users according to carrying capacity parameters.

Facility development at the NBHMA would be minimal throughout all management options since the primary goal of the area is to provide habitat for CWTB and special status species. Certain restrictions are common to all alternatives (Chapter Two, pg. 16). Access to public users will be non-motorized (*Federal Register*, September 9, 1994) and trails and roads would consist primarily of natural surfaces. The amount of maintained roads varies between alternatives.

Primary facilities being considered include: (1) parking areas with day-use structures such as water, restroom, information board and picnic tables; (2) road/trail infrastructure for access; and (3) river access. The three main sites considered for development include the main entrance, Doc's landing and the West entrance. Currently, only one facility has been developed, that being a school bus turnaround, installed for public safety reasons. There are safety and health issues related to public use relating to sanitation, water quality, vehicle safety along County Road 200 and unsafe structures on the ranch. The size of proposed developments varies between alternatives.

3. Water Quality / Quantity

- *How will management activities affect water quality and quantity?*

The NBHMA consists of three primary drainages that flow directly into the North Umpqua River and portions of two smaller drainages that flow into Cooper Creek Reservoir and Calapooya Creek (1997 North Bank WA [Watershed Analysis]). Almost all of the Powerline drainage, 40% of the Jackson Wayside, and 63% of the Round Timber drainage are contained within the NBHMA. (Table 1-1, 1997 North Bank WA). Due to previous land management and other factors, most of the waterways on the property are degraded. Active restoration of instream and riparian areas would improve the drainage network, reduce erosion and sedimentation, increase the amount of water available during the dry season, and improve habitat for whitetail deer.

Many of the roads on the NBHMA are currently degraded and in need of maintenance. The road network has been inventoried and segments that need repair have been identified. Many of the roads channel water, have insufficient drainage structures, and are affecting water quality by increasing sediment delivery to streams. Renovating roads needed for management or recreation and decommissioning unneeded roads would improve water quality.

Vegetation management practices that disturb soil (plowing, grazing, burning) have the potential to increase erosion unless vegetation is allowed to recover prior to heavy rainfall events. Vegetation management would be designed to limit the amount of disturbance, increase revegetation of disturbed areas, and allow for sufficient recovery prior to heavy winter rainfall.

Recreation may affect water quality by compacting soil, increasing erosion in heavy use areas, and unregulated human waste disposal. Monitoring recreation levels and managing use accordingly on highly erodible or sensitive areas would limit negative impacts from the recreating public. Site selection, timing, and design of trails and structures would mitigate potential negative impacts from users and developments.

4. Riparian / Wetland Habitat

- *How will management activities affect riparian / wetland habitat?*

Management activities would be designed to improve riparian and wetland habitat. Grazing, prescribed fire, water developments, plowing, plantings, and weed control are examples of management activities that could be employed. These activities would be designed to improve stream functionality and could alter stream side soils, vegetation, channel morphology, and streambank stability. These have the potential to affect downstream uses. Seasonal restrictions and design criteria for each management activity would mitigate potential impacts to water quality.

Many of the riparian areas on the NBHMA are degraded and in need of rehabilitation to improve riparian and wetland habitat and aquatic communities. Stabilizing active erosion areas, aggrading the stream bottoms, and revegetating the streambanks would be used to rehabilitate these areas. Stabilizing areas that are actively eroding would decrease erosion and sedimentation. Aggradation of the stream bottoms, by adding structures, would stabilize the streambanks, reverse downcutting of channels, and raise the water table. Raising the water table would increase the amount of water available for streamside vegetation, which would add additional stability and assist in increasing summer water availability.

Rehabilitation activities would have short-term, minor impacts, but long-term benefits to fisheries and riparian habitats. All instream work would be completed during the dry season when streams are dried up or at minimum flow.

Legal Requirements

There are regulations established for land use planning and management of land, wildlife, vegetation, water, and cultural resources.

The Federal Land Policy and Management Act (FLPMA) requires land use plans for all tracts of public land (Sec. 202a). Although a Roseburg District Resource Management Plan (RMP 1995) exists for the region, the management alternatives require an HMP. Special priority is also noted by FLPMA (Sec. 202 c. 3) for retaining those values for which the ACEC was established. The National Environmental Policy Act (NEPA) requires an analysis document on all actions potentially affecting the human environment. The preparation of an EIS in conjunction with the HMP would fulfill this mandate. The Endangered Species Act (ESA) of 1973 requires that essential habitats for special status species be managed consistent with the ESA and current recovery plans. This is reiterated as BLM policy in the Bureau Manual (6840.06 Special Status Species Management). Management for CWTDD would continue to be a high priority even if the species were delisted in the future.

Oregon Administrative Rules (635-51-048) restricts training dogs or allowing them to run loose during the game bird nesting season. Rule 498.102 of the Hunting, Angling and Wildlife Regulations restricts the use of dogs to hunt or track game mammals or birds. Oregon Revised Statutes (ORS 498.000, 1995, page 56) prohibit harassing or chasing wildlife. Hunting seasons will occur within time frames, limits, and special permits developed by the ODFW in cooperation with the BLM and USFWS. The Migratory Bird Conservation Act provides for the protection of migratory birds, cooperative investigations, maintenance of refuges, and appropriate enforcement. The Bald Eagle Act of 1940 protects eagles and their habitat.

Noxious weed treatments would be in accordance with the Noxious Weed Act (P.L. 93-629), the Carlson-Foley Act (P.L. 90-583), and the Oregon Administrative Rules (603-052-1200). The 400 acres of O&C lands for timber production would follow the O & C Sustained Yield Act of 1937 and the Northwest Forest Plan.

The Clean Water Act (CWA), Executive Order 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands), require federal agencies to protect wetlands and waterways from point and nonpoint sources of pollution, and to analyze the effects of federal actions on these areas. The objective of the CWA (Section 101a) is to restore and maintain the physical, chemical, and biological integrity of the nation's waters. Implementation of the CWA requires meeting water quality standards (WQS) for point and nonpoint sources of pollution. The Environmental Protection Agency (EPA) defines WQS with three components: 1) identification of beneficial uses of water;

2) numeric and narrative water quality criteria necessary to protect the identified beneficial uses as defined by DEQ; and 3) a provision for antidegradation. Standards and policies for the three components listed above are located in the Oregon Administrative Rules (340-41). The EPA and DEQ nonpoint source management strategy considers Best Management Practices (BMPs) a performance standard for meeting WQS. BMPs are described in Appendix D, Roseburg Record of Decision and are consistent with meeting State WQS. The BLM's role in controlling nonpoint sources of pollution concerning the State strategy (in conjunction with EPA) is identified in a Memorandum of Agreement with DEQ. For small wetland projects, the BLM will seek the guidance of the ODFW and will follow the permit procedures established by the State Water Resources Department (OAR 690-Division 11). Fill and dredging activities would require a section 404 permit per CWA from the Division of State Lands and Army Corps of Engineers. Water right filings will be processed according to State Water Resources Department (OAR 690-Division 11) regulations. Executive Order 11990 requires federal agencies to avoid, to the extent possible, adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists. Executive Order 11988 requires federal agencies to evaluate the potential effects of actions they may take in a floodplain and to avoid, to the extent possible, adverse effects associated with floodplain development.

The Architectural Barriers Act of 1969, Rehabilitation Act of 1973, and Americans with Disabilities Act (ADA) of 1990 denote the need and expectation of accessible facilities. Site planning has considered access needs and has ensured that routes to and from major developed areas are accessible and incorporate universal design concepts to meet or exceed minimum standards and measurements for accessibility. The use of existing roads/trails and natural surfaces may not meet minimum slope standards of the ADA due to the steep nature of the terrain.

In accordance with the National Historic Preservation Act, ground disturbing projects would be surveyed for archeological resources.

The Proposed Action specifies construction of water catchments. Permits would need to be obtained from the State of Oregon Water Resource Department (OAR 690-11-014 (4)(f)).

A right-of-way agreement with Lone Rock Timber Company (R-767) encumbers a portion of the north part of the NBHMA.

Consistency with State, Local, Tribal and Other Federal Plans

This plan was developed jointly with the U.S. Fish and Wildlife Service and the Oregon Department of Fish and Wildlife to insure consistency with federal and state regulations and plans. Notification was provided to certain Tribal Governments (Analysis File, 5/12/97). No concerns were noted.

This plan was designed to be in general conformance with the *Final - Roseburg District Proposed Resources Management Plan / Environmental Impact Statement (PRMP/EIS)* dated October 1994 and its associated *Roseburg District Record of Decision and Resources Management Plan (RMP)* dated June 2, 1995; and the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS)* dated February 1994; and its associated *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD)* and

Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl (S&G's) dated April 13, 1994; generally referred to as the "Northwest Forest Plan" (NFP).

The NBHMA falls under the NFP designation of "Administratively Withdrawn Lands" and under the RMP as an "Area of Critical Environmental Concern" (ACEC). The RMP requires that we "[r]etain and modify existing Special Areas to maintain or protect the resource values for which they were originally designated (RMP pg 50). Special Areas include ACEC's (RMP pg 50). Also "[n]ewly acquired or administered lands ... will be managed for their highest potential or for the purposes for which they were acquired (RMP pg 84)." The NBHMA was acquired to provide secure habitat for CWTD and other special status species and meet requirements set forth in the Columbian White-Tailed Deer Recovery Plan (1983), to move the species toward delisting from the endangered species list (Exchange EA pg 1). As a result, this plan of necessity may be inconsistent with the RMP and NFP in some instances. The standards and guidelines in the above plans were designed for implementation for late-successional and old-growth dependent species such as the northern spotted owl, whereas this plan was developed for management of the CWTD, a species that seems to prefer oak savanna and its associated riparian habitat. For this reason, the Management Actions prescribed in this EIS would not necessarily adhere to the S & G's of the NFP or the management actions of the RMP. The deviations in this EIS generally deal with treatment of riparian areas and the discouragement of conifer succession. Where this EIS deviates from the NFP and the RMP, it will be noted and the Decision Record will reflect the rationale for these departures or deviations.

This plan was also developed to be consistent with the decisions that were made as the result of the Environmental Assessment for Proposed Dunning Ranch Exchange. This plan does modify a decision in the Exchange EA to set aside 400 acres for timber production. The EIS would change the location of the acres to be managed for timber production. The Exchange EA specified a contiguous block whereas the ID Team felt that it would be better for the CWTD to disperse these areas throughout the ACEC (see Figure 10). This would result in a discrepancy between the Exchange EA and the RMP. The Exchange EA designated approximately 6,181 acres as ACEC (Exchange EA, Exhibit C), however, the RMP (Table 5, page 89) lists the North Bank ACEC as 6,221 acres. The remaining acres, 400 under the Exchange EA or 360 under the RMP, was intended to be managed for timber production (as per agreement with Douglas County during the exchange process). The EIS proposes to classify the entire NBHMA (6,581 acres) as an ACEC with timber production emphasis on selected areas (totaling approximately 400 acres). This would necessitate a change in the RMP under Plan Maintenance.

To define roles and continue a cooperative interagency framework in implementing this plan, a Memorandum of Understanding (MOU) was signed between the BLM, ODFW, and USFWS (see Analysis File). This MOU ensures continued management for CWTD. This cooperative agreement follows provisions of the Sikes Act. Upon completion of a draft plan, the BLM will seek consultation with the USFWS and National Marine Fisheries Service (NMFS).

Using This Document

Chapter Two of this document summarizes the attributes of the three alternatives and project design features used to reduce or mitigate impacts to the four key issues. Chapter Three describes the affected environment. It includes previous land management practices, the current condition of water, soils, flora, wildlife, and other resources of the NBHMA. Chapter Four evaluates the environmental consequences of each alternative. The key issues defined in Chapter One are used in Chapter Four to

help the reader recognize the differences between each alternative and to understand the environmental consequences to the key issues. This EIS describes potential projects to be implemented under the Proposed Action Alternative in broad general terms. The HMP was developed to describe the objectives of the Proposed Alternative and the individual projects that could be developed in a more detailed and specific manner.

The appendices provide supporting information. Other materials pertinent to this plan are available in the NBHMA Analysis File at the Roseburg BLM District Office at 777 NW Garden Valley Boulevard, Roseburg, Oregon, 97470.

Chapter Two

Alternatives Including the Proposed Action

Introduction

This chapter describes three management alternatives and summarizes differences between each alternative. These alternatives represent a reasonable range of potential actions that could occur on the NBHMA. The chapter begins by noting alternatives not considered in detail and the rationale for dropping those actions. Then, actions common to all of the alternatives are described to help the reader understand basic actions that would occur on the NBHMA regardless of which alternative is selected. Next, the management actions that could occur under the various alternatives are described, followed by a description of each alternative. Table 2-2 summarizes the three management alternatives and their individual actions. This table allows comparison of the differences between the management actions of each alternative. The chapter concludes with a summary of project design features and mitigation techniques used to help reduce negative impacts to the key issues presented in Chapter One.

Alternatives Considered but Eliminated

The interdisciplinary (ID), multi-agency team considered five actions that were subsequently dropped from further analysis.

- *Allow Public Motorized Use of the Area*

This alternative was not considered in detail since motorized public use would be in conflict with the primary goal of the NBHMA, the Resource Management Plan (DRMP 1995, page 59) and could disrupt those resource values that led to designating the area as an Area of Critical Environmental Concern (ACEC). The area was established as a non-motorized area in 1994 (Federal Register, September 9, 1994) to "minimize wildlife disturbance and habitat degradation and to protect soil and water resources." The need to minimize disturbance to the CWT and other species of special concern and to protect the ACEC values still exists, thus any action to reverse the Off Highway Vehicle (OHV) closure was dismissed. This would not preclude case by case exceptions for limited temporary access to accomplish management purposes.

- *Develop a Campground on the Area*

Developing a campground was determined to be incompatible with both the primary goal of managing habitat for CWT and other Special Status Species and protecting the integrity of the ACEC values. Since the greatest value of the NBHMA is to secure habitat for the CWT, the ID Team decided to minimize facility development. Given the steep terrain of the area and the degraded condition of the roads, developing a campground, particularly one suited for electrical and sewer hook-ups, would be difficult. The alternative to develop a campground was dropped in order to minimize disturbance to the area's natural resources.

- *Develop a Remote Control Airstrip*

A remote control airstrip would be used by a relatively small sector of the public; yet the noise intrusion would affect other users such as hikers, bikers, horseback riders and picnickers, as well as the CWT itself. Given the relatively specialized use of a remote control airstrip, the noise disturbance to other users and wildlife and the decision to keep facility development minimal, this proposal was dropped from further consideration.

- *Develop a Shooting Area*

Developing a shooting area would cause noise disturbance similar to that created

by a remote control airstrip. Again, given the relatively specialized use of a shooting area, noise disturbance to other users, adjacent landowners and wildlife, plus the decision to keep facility development minimal, the action to develop a shooting area was dropped. Firearm use would be restricted to only lawful hunting on the area. Target shooting would be prohibited.

- ***Prohibit Hunting on the Area***

Some adjacent landowners were concerned about the safety of allowing hunting on the area. The Exchange EA (page 5) permits hunting on the NBHMA. Presently the ODFW, BLM, and USFWS have cooperatively restricted hunting. Two types of hunting are allowed in the area: limited entry big game hunting and general season game bird hunting. Controlled/special permit hunts limit the number of Big Game hunters allowed to hunt on the area, the season in which hunting is open, and type of animal which can be harvested, (i.e., a particular age or sex). Controlled hunts can also specify types of hunters (youth, master hunters, etc.) and require mandatory training. Presently, both master hunters and youth hunters (accompanied by an adult) who receive a license to hunt, attend a mandatory class that teaches the skills necessary to distinguish a black-tailed deer from a CWTD. Game bird hunting is allowed and the number of hunters is not restricted. Future changes in current hunting practices would depend on the management objectives and population levels of game species. Most adjacent landowners support hunting with these restrictions. Since season dates, number of hunters, species available to hunt, and safety zones can be modified to address safety concerns and control accidental take of CWTD, the option to reverse the 1993 EA decision and prohibit hunting was dropped from further analysis.

Actions Common to All Alternatives

Several management actions were recommended for all of the alternatives, including the No Action alternative. Some of these actions are required by law or policy (e.g. protecting water resources). Other actions, such as motorized use and timber production, are defined in the Exchange EA or were established as interim guidelines to guide management activities.

1. Roads and trails - Motorized use would not be permitted by the public except to access parking areas. State or federal personnel performing official duties or personnel conducting fire fighting or emergency activities may use motorized vehicles. Approximately 2.5 miles of road would be rocked all weather roads giving access to Main Barn Pavilion, Middle Feeder Barn, and Jackson Ranch. The remaining roads would be natural surfaced, seasonal access only. Use of highway vehicles on naturally surfaced roads is seasonally limited to avoid rutting or other road damage during wet periods and prevention of vehicle caused grass fires in the dry season. The maintenance of naturally surfaced roads would consist of surface blading, installing water control features (ditches, culverts, drain dips, etc.) and repair of areas contributing to hydrologic impacts. Roads in excess of administrative need would be considered part of the trail system. Official use of ATVs is permitted on trails as well as maintained roads for research and management purposes year round. Personnel using motorized vehicles are responsible for avoiding road/trail degradation. Non-motorized use of maintained and non-maintained roads and trails by the public would be allowed unless otherwise posted. Road and trail maintenance work would be conducted between May 15 and October 15 (dry season) or as conditions warrant.

2. **Recreation** - Hiking, mountain biking, equestrian use, hunting, primitive camping, environmental education and other non-motorized uses would be permitted. Restrictions on the number or type of use and location of use may be imposed to protect Special Status Species and avoid degradation of ACEC values. Safety zones for hunting may be designated to minimize user conflicts. Primitive campers within the area would be required to register, follow the "Leave No Trace" program and abide by seasonal restrictions on fire use.
3. **Special Events** - These events would be permitted on a case-by-case basis through an application process and issuance of special permit. Events would be allowed only in non-sensitive areas consistent with the primary goal.
4. **Cultural Resources** - All projects of a ground-disturbing nature would be inventoried for cultural resources prior to implementation to identify any cultural resources that could be disturbed. A public archaeology program at site 35D061 would be developed to provide educational opportunities.
5. **Wetlands Projects** - Work within the streams, riparian areas, and wetlands would occur between May 15 and October 15, or as conditions warrant. Where use of heavy equipment is necessary it would be limited to the dry season. The travel way for equipment traveling to isolated headcut sites would be limited and where possible confined to existing roads and trails. The work area around these sites would be limited, to control compaction at the site. A 25-foot buffer along streams would be maintained except for those project specifically targeting in stream work and riparian zone enhancement. In-stream work would be accomplished from July 1 to September 15 to minimize adverse effects of sedimentation on aquatic organisms (Figure 7).
6. **Timber Production** - 400 acres have been designated for timber production. Harvest would be based on an 80-year rotation consistent with the 1993 Exchange EA and the Roseburg District RMP's guidelines for Connectivity/Diversity Blocks (Figure 10).
7. **Noxious Weeds** - Integrated Pest Management would be used to control infestations of noxious weeds along roads, around buildings, and at heavily used recreation sites. Additional infestations would be controlled according to priorities. All tools, including biological, chemical or mechanical control methods would be employed. BLM Manual H-9011-1 (page II-24) specifies protective buffer strips for applications as follows: aerial, 100 ft.; vehicle, 25 ft.; and by hand, 10 ft.
8. **Special Status Species** - Surveys, monitoring, and research on Special Status Species (plant and animal) would be conducted to provide data on how to manage populations for long-term viability (see Glossary).

The following table describes the Management Actions (MA's) considered in this EIS:

Table 2-1. Management Actions (MA)

Action	Comments
MA 1 - Roads	This action deals with how the road infrastructure would be managed. Possible actions would include decommissioning (removal of culverts, subsoiling of the road surface, blocking access, and seeding bare surfaces) of identified roads that are not needed for management and yet contribute to degraded conditions if left in their current condition. Other existing roads that are needed for all weather management use would be brought up to BMP (Best Management Practices) standards (RMP, page 136-7) through the addition of crushed rock surfacing and installation of drainage features. Most roads would be left as natural surfaced roads that would receive periodic maintenance (grading, culvert and ditchline maintenance, and noxious weed control).
MA 2 - Trails	This action deals with how the trail infrastructure would be managed. Roads not used for management access would be used as trails. Trails would be used mostly for recreation, but could also be used for management access by authorized personnel or as part of a fire line for prescribed burning. Additional trails could be created for recreation or as fire trails for prescribed burning. Newly created fire trails would be waterbarred according to the BMP (Table D-1, RMP, page 136). Some trails may be closed due to unacceptable erosion or damage.
MA 3 - Pullout Parking	Pullout parking would be provided along County Road 200 to provide safe areas for pulling off the North Bank Road. Other pullout areas would be decommissioned.
MA 4 - Public Access	This action deals with how public access to the NBHMA would be managed. Motorized use would only be permitted by the public to access parking areas. Personnel performing official duties, conducting fire fighting or emergency activities may use motorized vehicles. Motorized vehicles may be used on decommissioned roads or roads converted to trails by official personnel for emergency use. Use of highway vehicles on maintained roads is seasonally limited to avoid damage to roads. Official use of ATVs is permitted on trails as well as maintained roads for research and management purposes. Personnel using motorized vehicles are responsible for avoiding road/trail degradation.

Table 2-1. Management Actions (MA)

Action	Comments
	Non-motorized use of roads and trails by the public would be allowed for hiking, mountain biking, equestrian use, hunting, primitive camping, environmental education, and other non-motorized uses unless otherwise posted. Restrictions on the number or type of use and location of use may be imposed as necessary to protect species of special concern and avoid degradation of ACEC values.
MA 5 - Main Barn Pavilion MA 6 - West Entrance MA 7 - Doc's Landing MA 8 - Watchable Wildlife Sites	These actions (MA 5 through 8) deal with how these facilities would be developed.
MA 9 - Primitive Camping	This action deals with how the Primitive Camping program would be administered. Primitive campers within the area would be required to register and follow the "Leave No Trace" program. Seasonal restrictions on fire use would be imposed as necessary.
MA 10 - Environmental Education	This action deals with how the Environmental Education program would be administered, including use of signs and interpretive information.
MA 11 - Special Status Plants	This action deals with how Special Status Plant habitat (see Glossary) would be managed.
MA 12 - Wetlands, Stream Rehabilitation and Water Source Development	This action deals with how the wetlands and water resources would be managed. Additional wetlands would be created or enhanced under some alternatives and water sources developed for wildlife. Actions could include the use of explosives to create water sources, installing guzzlers, and the use of heavy equipment to repair headcut areas and develop water sources. Plantings of riparian vegetation and placing structure in stream channels would also be included in some alternatives.
MA 13 - Grasslands & Savanna MA 14 - Hardwood / Conifer MA 15 - Oak Woodlands	MA 13 through 15 deal with how the natural succession of these vegetation types would be managed.
MA 16 - Other Habitat	This action deals with how other habitat features, such as rock outcrops and ash wetlands, would be managed.
MA 17 - Timber Management	This action deals with how timber production would be managed.

Table 2-1. Management Actions (MA)

Action	Comments
MA 18 - Vegetation Management	This action deals with the tools that would be used to accomplish manipulation of vegetation and control of noxious weeds. Grazing, prescribed fire and thinning of conifer and hardwood stands would be used under various alternatives to accomplish desired vegetation manipulation. Noxious weeds would be controlled using Integrated Pest Management techniques including biological, mechanical, cultural, and chemical controls.
MA 19 - Forage Plots	Forage plots would be developed under both action alternatives that would allow for the tilling of plots to be planted with legumes, grasses, and fruit to supplement the current food supply for wildlife.
MA 20 - Wildlife Structures	This action deals with the development of certain structures for wildlife such as bird houses, perches, and bat boxes.

Description of the Alternatives

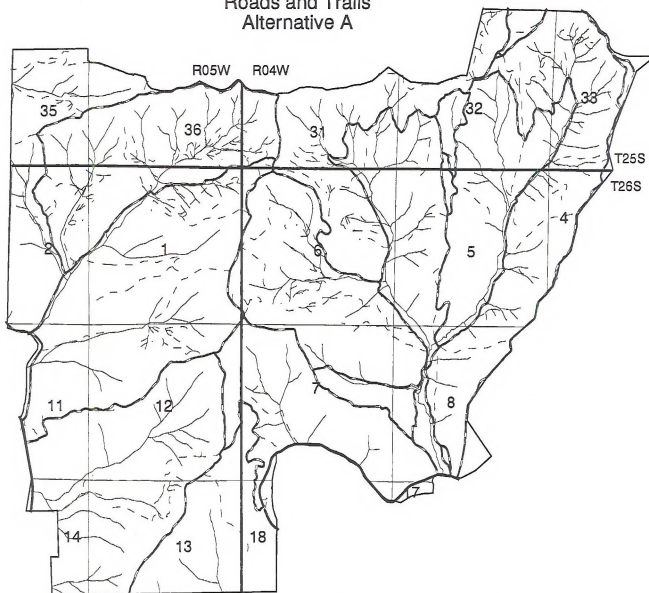
Table 2-2 describes the alternatives, including the No Action (Alternative A) and Proposed Action (Alternative C). The actions are referred to as Management Actions (MA). When discussing the alternatives, actions may be referred to as MA1.C (Management Action 1, Alternative C).

Alternative A (No Action Alternative) in this plan is defined as "continuing present management activities" and is described in the Exchange EA. Present management would include the activities common to all alternatives previously described. Under the No Action Alternative, management is minimal. Management priorities would be based on legal mandates. Recreational facilities and access would not be developed beyond current levels; safety and sanitation problems would remain as they are presently. All current roads and trails (approximately 32 miles of road and 40 miles of trail) would be open to non-motorized recreation, cross-country travel, and overnight camping (Figure 3). Camping would not be restricted except as posted. Motorized access to the Main Barn area could be allowed by special permission. Parking and restroom facilities would not be improved beyond current levels. Normal fire suppression would be employed, but vegetation would be allowed to progress through natural succession causing habitat changes over time. All current roads would potentially be available for management use, but roads would be repaired only as necessary to gain access to implement a management action. No sources of water in addition to existing ones, dispersed forage plots, or structures for wildlife would be developed. Watchable wildlife sites or environmental education programs would not be developed. Any proposed project would need to be planned on a case-by-case basis. Those projects determined to be categorically excluded from NEPA requirements would be documented as a Categorical Exclusion. Those projects that are not categorically excluded would have an Environmental Assessment with normal public input and review.

Figure 3





North Bank Habitat Management Area

Roads and Trails
Alternative A



Scale 1:37000
0.5 0 0.5 1 Miles

Legend

-  Roads - 32 Miles
-  County Road - 2.5 Miles
-  Trails - 39.8 Miles
-  Streams

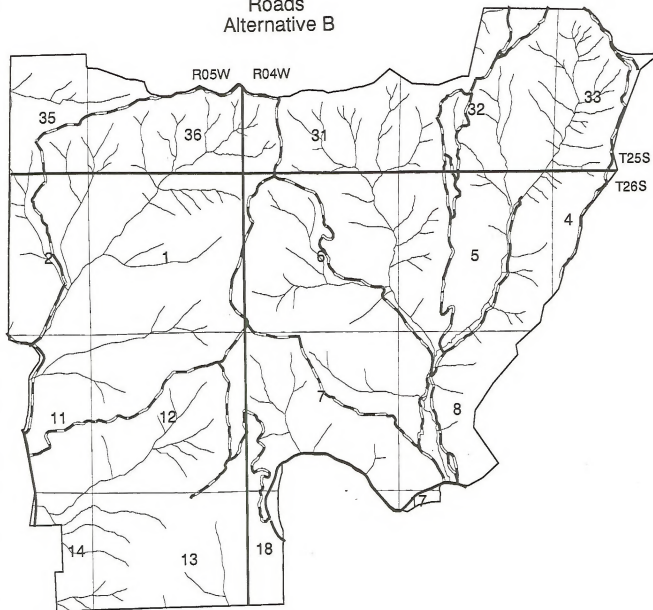
Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



Figure 4




North Bank Habitat Management Area

Roads
Alternative B



Scale 1:37000
0.5 0 0.5 1 Miles

Legend

-  Roads - 23 Miles
-  County Road - 2.5 Miles
-  Streams

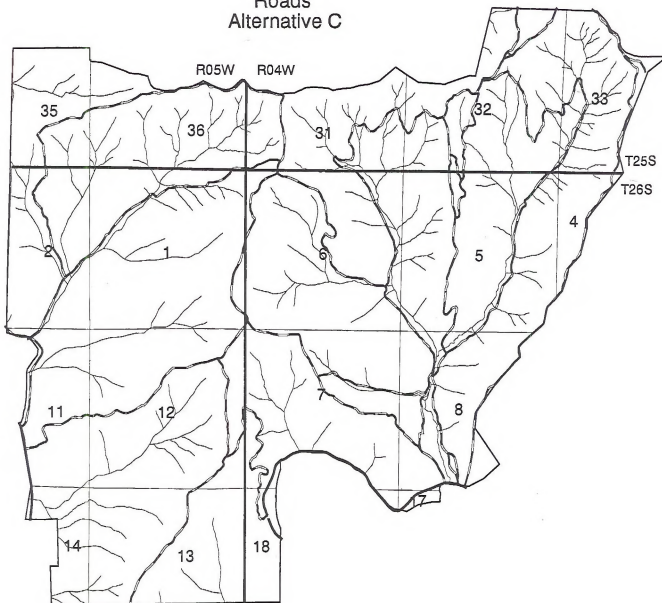
Information used for this map was produced using GIS from the North Bank Watershed Analysis



Figure 5




North Bank Habitat Management Area

Roads Alternative C



Scale 1:37000
0.5 0 0.5 1 Miles

Legend

-  Roads - 32 Miles
-  County Road - 2.5 Miles
-  Streams

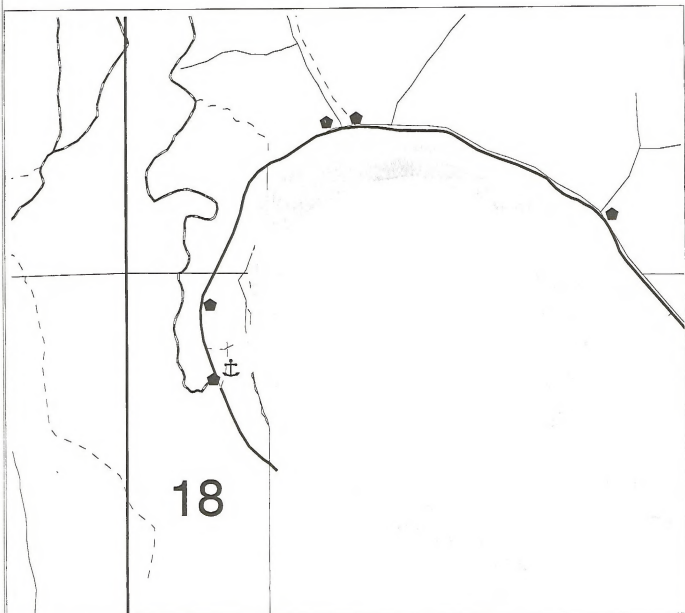
Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



Figure 6

North Bank Habitat Management Area

Pull Out Areas



Legend

■ Pull Out Areas

⚓ Doc's Landing

N. Umpqua River

∧ Streams

⚡ Roads
⚡ County Road
⚡ Trails

Scale 1:9500

1000 0 1000 2000 Feet



Information used for this map was produced using GIS from the North Bank Watershed Analysis

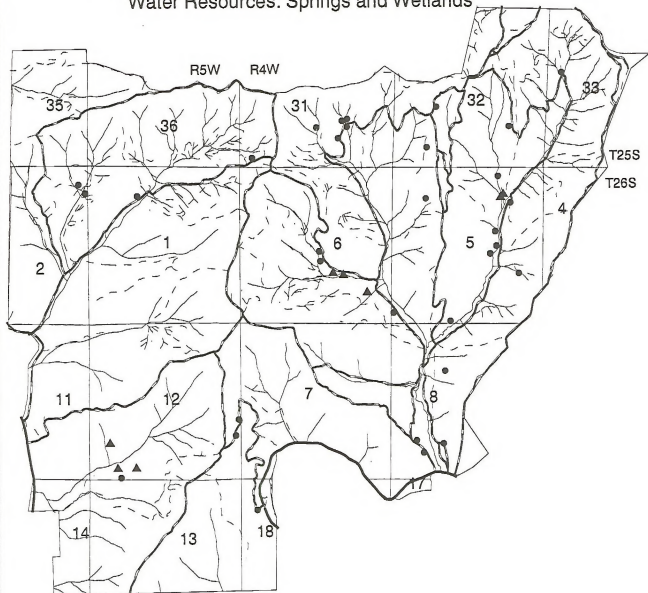
Alternative B represents the low end of management activity with many actions similar to the No Action alternative. Alternative B seeks to maintain the current proportions of habitat types (oak woodland, grassland, etc.) and improve the vegetative condition within the habitat types through active management. This would be accomplished by burning, mowing, fertilization, reseeding, and thinning. Up to 2,000 acres per year of vegetation could be treated in combination of these methods. Selected populations of Special Status Plants and its habitat would be enhanced. No additional wildlife water sources would be created; however, up to 40 acres of forage plots would be planted in small (less than five-acre plots) and dispersed across the area to provide more nutritious feeding of CWTDD. Existing pullout parking would be enhanced and interpretive panels/kiosks would be placed at some parking areas. No other facilities would be developed beyond current levels. Non-motorized use would be allowed on the existing roads and trails. Cross-country travel would be allowed for hikers and equestrian users. Mountain bikers could use existing roads and trails. Some areas may have seasonal or permanent closures to protect sensitive sites or Special Status Species. Approximately 23 miles of road would be maintained for administrative use (Figure 4).

Alternative C is the Proposed Action and represents active management that would enhance CWTDD habitat as well as habitat for other Special Status Species. Approximately 32 miles of road would be maintained for administrative use (Figure 5). Recreation facilities that are compatible with management of the CWTDD would be developed and other Special Status Species. Parking and restroom facilities would be developed at three sites (Main Barn Pavilion, West Entrance, and Doc's Landing). Up to five pullouts would be expanded to accommodate parking off of County Road 200 and allow overnight camping in self-contained units (Figure 6). Watchable wildlife sites would be developed to enhance wildlife viewing opportunities for the public. Written materials, signs, and programs would be developed as part of an environmental education program for the general public, user groups, and schools. Tours and special access would be allowed for some educational programs. The creation of additional recreational trails would be allowed to route non-motorized users around sensitive sites or to avoid safety hazards. Based on on-going research (Forage Plot Partitioning by Columbian White-Tailed and Black-Tailed Deer, Lowell W. Whitney) results on the food, cover and survival needs of CWTDD, vegetation management would be allowed to enhance and enlarge habitat for CWTDD. Once it is known what the deer need, additional land could be converted to habitats found to be more beneficial to CWTDD. Alternative C would potentially add up to 700 additional acres of grass-savanna habitat. Up to 2000 acres per year of vegetation could be treated in combination of those methods described under Alternative B, however grazing would also be included as a tool. Experimental populations of Special Status Species would be established. Other habitat areas, such as ash wetlands, would be restored through propagation and planting. Approximately one source of perennial water for wildlife would be established per every 320 acres for wildlife (approximately 20 water sources). Developments would not exceed five acres per site and would generally be less than two acres (Figure 7). Certain degraded stream reaches and riparian areas would be rehabilitated. Up to 250 acres of specifically created habitats would be planted to provide forage for CWTDD and other wildlife (Figure 8). In addition to enhanced natural structures for wildlife, artificial structures such as bat and bird houses would be placed on the property. Grazing would be used in addition to the tools cited in Alternative B. Conifer encroachment would be discouraged and selected conifer stands outside the timber production areas would be managed to provide larger, older tree attributes (snag creation, down wood, thinning) for other species (Figure 9).

Figure 7

North Bank Habitat Management Area

Water Resources: Springs and Wetlands



Legend

- ▲ Wetlands
- Springs
- Streams
- - - Roads
- ... Trails
- ▬ County Road

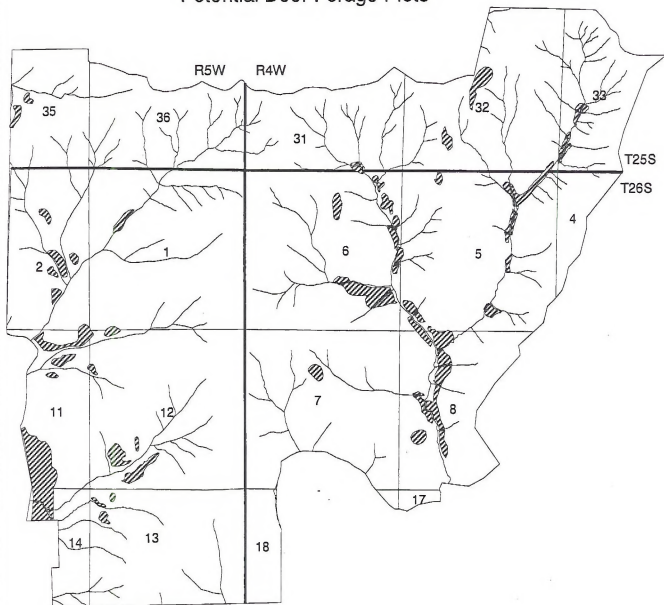
Scale 1:37000
0.5 0 0.5 1 Miles



Information used for this map was produced using GIS from the North Bank Watershed Analysis

Figure 8

North Bank Habitat Management Area Potential Deer Forage Plots



Legend

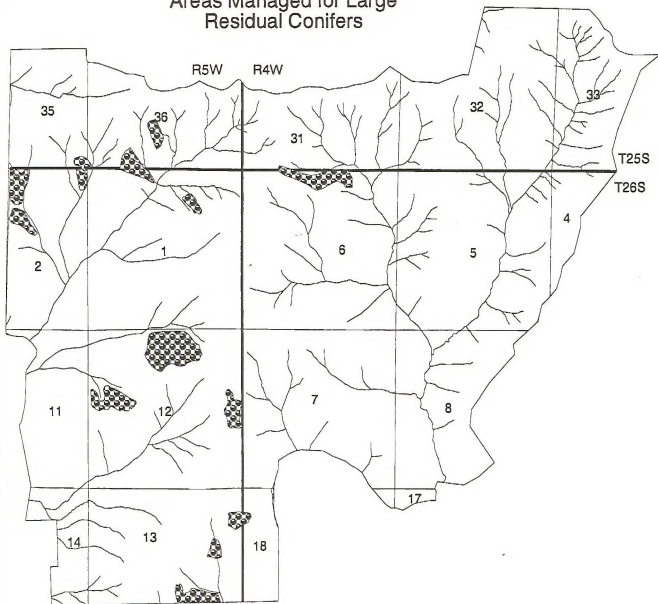
- Streams
- Potential Deer Forage Plots

Information used for this map was produced using GIS from the North Bank Watershed Analysis

Figure 9

North Bank Habitat Management Area

Areas Managed for Large
Residual Conifers



Legend



Streams

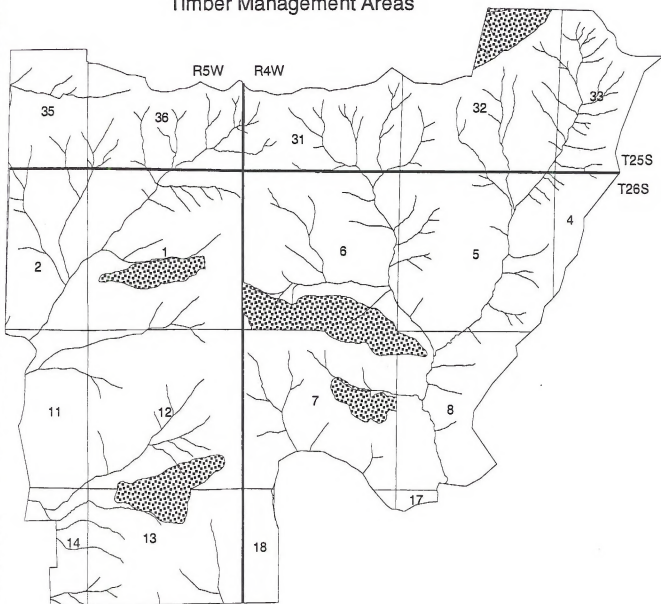
Areas Managed for Large Residual Conifers - 180 Acres

Information used for this map was
produced using GIS from the North
Bank Watershed Analysis

Figure 10

North Bank Habitat Management Area

Timber Management Areas



Legend



Streams

Timber Management Areas - 400 Acres

Scale 1:37000

0.5 0 0.5 1 Miles

Information used for this map was produced using GIS from the North Bank Watershed Analysis

Table 2-2. **Summary of Management Actions by Alternative.** The deviations from the RMP and the Standards and Guidelines of the NFP are included for comparison with Plan consistency.

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA1 - Roads	Maintain all roads (32 miles) presently existing (Figure 3).	Maintain 23 miles of road (Figure 4). Chasm Creek, Blacktail Basin and Soggy Bottoms road segments would be removed from the management road system. Roads not maintained for management access would be converted to trails.	Same as Alt. A (Figure 5).	Would deviate from RMP BMP G. 11 - "Surface inadequately surfaced roads that are to be left open to traffic during wet weather".
MA2 - Trails	Remaining existing roads (40 miles) are designated as trails and use allowed for cross-country travel for mountain bikes, horses, or hikers unless otherwise posted. Trails could be used for emergency use (ex. wild fire suppression) (Figure 3).	Same as Alt. A, except no cross-country travel allowed by mountain bikes. Overall maintenance would be minimal. Fire trails could be constructed for prescribed burning. Those roads converted to trails would still be available for temporary management access.	Same as Alt. B, plus allow development of additional non-motorized recreational trails to route users around sensitive areas and avoid safety hazards, to link popular use sites, or to avoid user conflicts. This would include the replacement of unsafe stream crossings on Chasm and Jackson Creek with large culverts.	

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA3 - Pullout Parking Development (Figure 6)	As presently existing.	Improve five major existing pullouts by stabilizing or enlarging some road shoulders. Pullouts which are considered safety hazards would be decommissioned.	Same as Alt. B plus set the fence/gates on selective pullouts onto the property to allow enlarged parking pullouts sufficient to accommodate trailers and RVs. Overnight camping in self- contained RV units would be allowed at these pullouts.	Some construction / reconstruction could occur with the riparian areas.
MA4- Public Access	Access by the public would be by foot, bicycle, or horseback. Motorized access to Main Barn area by special request.	Same as Alt. A.	Motorized access to parking lot at the Main Barn pavilion, West Entrance site (school bus turn around) and Doc's Landing, or through special permission. Public access would be permitted for commercial harvest of special forest products that is consistent with the management of CWTD habitat.	

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA5- Main Barn Pavilion Development	No development except the portable chemical toilet & small information board currently at the barn. The main barn does not meet building code for public use and would be torn down.	Same as Alt. A.	Develop a gravel parking area. Build a group shelter (30'x40'). Establish a BBQ pit, four outside picnic table sites, a double vault toilet, manure bin, and information board. Main gate would be closed and locked at night.	Construction within the riparian area and potential in stream work.
MA6- West Entrance Development (school bus turn around)	No development except current portable chemical toilet and existing school bus turn around.	Same as Alt. A.	Expand surfaced parking lot to accommodate 10 single parking spots and space for two large vehicles. Install a single vault toilet and information board. Fence the parking lot area. Day-use activities only. No gate unless necessary.	
MA7- Doc's Landing Development	No development.	Same as Alt. A.	Improve access and develop five surfaced parking sites, single vault toilet, and concrete boat ramp for water access for fire suppression equipment and recreation. Day-use activities. No gate unless necessary.	Development would take place within the riparian area and 100-year floodplain. The restroom facility would be placed outside the 100-year floodplain.

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA8- Watchable Wildlife Sites	No development.	Same as Alt. A.	Develop sites with interpretive signs, blinds, or benches.	
MA9- Primitive Camping	Unregulated.	Same as Alt. A.	Allowed by registration. Implement "Leave no Trace" Program. Campsites not allowed within 50 feet of streams; human waste disposal required. Seasonal restrictions on fire use.	
MA10- Environmental Education	Some information about CWTD and the property would be available upon request and occasionally posted, but no interpretive or environmental education programs would be developed.	Interpretive panels/kiosks at major parking areas (Main Entrance and West Entrance).	Same as Alt. B plus Environmental Education program developed with signs, displays, and brochures. Special tours/access by permission for schools or groups.	
MA11 - Special Status Species	Maintain all existing populations of Special Status Species.	Same as Alt. A plus select populations would be enhanced by habitat improvements and monitored.	Same as Alt. B plus experimental populations established by transplanting or seeding in suitable habitat and monitored.	RMP Special Attention species (Survey and Manage, Protection Buffer) would not be afforded special protection except in the areas designated for timber production.

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA12- Wetlands, Stream Enhancement and Water Source Development	Maintain current condition.	Same as Alt. A.	Maintain, enhance or create wildlife ponds, wetlands or artificial wildlife water sources to provide year-round, dispersed sources of water (approximately 20 water sources). Developments up to five acre maximum per site but generally less than two acres. Certain degraded stream reaches and riparian areas would be rehabilitated (Figure 7).	Development of water sources would not meet ACS objectives in the short-term.
MA13- Grasslands & Oak Savanna (Currently about 1,890 acres or 29% of the land base)	Normal fire suppression, seral stage development allowed to progress.	Enhance existing grasslands and savannas through management actions such as burning, fertilization, mowing or thinning.	Same as Alt. B, except the use of grazing would be included.	
MA 14 - Hardwood / Conifer (Currently about 3,410 acres or 52% of the land base)	Normal fire suppression, allow to progress through seral stages.	Maintain current condition by management actions including cutting, thinning, and burning.	Same as Alt. B, except a portion of this vegetation type could be converted to oak savanna based on the results of ongoing research.	

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA15- Oak Woodlands (Currently about 1,150 acres or 17% of the land base)	Normal fire suppression, allow to progress through seral stages.	Maintain or increase the vigor of currently existing oak woodlands through controlling competition and density of shrubs and conifers.	Same as Alt. B, except a portion of this vegetation type could be converted to oak savanna based on the results of ongoing research.	
MA16- Other Habitats Rock outcrops, ash wetlands, riparian areas. (Currently about 130 acres or 2% of the land base)	Existing, allow to progress through seral stages.	Retain existing level and retard seral progression by active management (thinning, mowing, and burning).	Same as Alt. B plus: Restore select habitat areas (Special Status Species) through propagation and planting.	
MA17- Timber Management (Approximately 580 acres of conifer stands could produce timber. 400 acres are designated for timber production (page 17, Figure 10).	Four hundred acres would be managed for timber production. Remaining acres (180 ac.) would be allowed to progress through seral stages (Figure 9).	Same as Alt. A. except conifer encroachment outside of remaining sites would be controlled by active management such as cutting, thinning, or burning to enhance CWTD habitat. Potential commercial removal of small diameter pole timber.	Same as Alt. A. except the remaining 180 acres of selected conifer stands would be managed to provide large tree attributes for other species such cavity dwellers, raptors, bats, etc. by active management such as cutting, thinning, burning, and snag and down wood creation.	

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)	RMP/NFP Deviations
MA 18 - Vegetation Management	Integrated Pest Management would be used to control infestations of noxious weeds. Seral stage development allowed to progress.	Same as Alt. A plus all management tools except grazing would be used to maintain the current extent of habitat. Up to 2,000 acres per year could be treated.	Same as Alt. A plus all management tools including grazing would be used to enhance CWTD and other Special Status Species habitat.	
MA19- Forage plots	No development. Forage would be based on food currently available.	Plant up to 40 acres of dispersed forage patches (improved pasture/hay, legumes, fruits, etc.)	Plant up to 250 acres of dispersed forage patches (Figure 8).	Non-native plants would be used, (current forage is predominantly non-native).
MA20- Wildlife Structures	No development. Wildlife would use existing natural structures for denning, nesting, and shelter.	Enhance natural structures. Techniques such as girdling, cutting limbs, or drilling would be used to create natural structures.	Same as Alt. B plus artificial structures such as bird houses, raptor perch poles, bat houses, and hibernaculums would be installed.	

Project Design Features for Management and Mitigation by Issue

These Project Design Features (PDF) were developed for Alternative C (Proposed Action). Management actions in other alternatives that are similar to Alternative C would have the same PDF. These PDF were established to guide management activities and to mitigate impacts. The PDF described below are presented under key issues identified in Chapter One to help the reader understand more precisely what measures are being taken to mitigate impacts to these key resources. Chapter Four provides a detailed discussion of the environmental consequences of each alternative's management actions on each key issue. The HMP describes the management actions and project specifics needed to implement the Proposed Action alternative. These projects would receive ID Team review as they are developed and BMPs (RMP, Appendix D) would be prescribed as part of the project design.

Issue: Columbia White-tailed Deer and Special Status Species

This issue is concerned with how recreational activities, developments, or other management actions would affect the CWTD and other Special Status species.

MA1 - Roads, MA2 - Trails

Restrict road and trail maintenance activities around sensitive sites during specific seasons when species may be vulnerable to disturbance. New recreation trails could be developed as needed to avoid sensitive areas. Conduct pre-project surveys prior to trail construction to provide buffers for the protection of Special Status Species.

MA4 - Public Access

Restrict access to sensitive sites during specific seasons when species may be vulnerable to disturbance. Restrictions may include limitations on the season of use, type of use, number of users, or location of use. Trail use near sensitive sites may be restricted.

MA5 - Main Barn Pavilion, MA6 - West Entrance, MA7 - Doc's Landing Developments

Conduct pre-project surveys prior to construction to provide buffers to protect Special Status Species and critical habitat. Monitor human use at facilities and on the property. Reduce/restrict the level of use or type of activity if conflicts with Special Status Species arise.

MA8 - Watchable Wildlife Sites

Limit placement of sites to those areas outside of special or sensitive habitat areas. Restrict use if conflicts with Special Status Species arise. Conduct pre-project surveys prior to construction to provide buffers for the protection of Special Status Species.

MA9 - Primitive Camping

Restrict or prohibit camping in sensitive areas. These restrictions would be provided to campers at registration. Monitor use and adjust restrictions if conflicts with Special Status Species or other users arise. Restrict campfires during the dry season to prevent wildfires. Require "Leave No Trace" Camping and removal of human waste.

MA10 - Environmental Education

Restrict access to sensitive sites during specific seasons. Develop signs to provide information about the needs and status of various Special Status Species.

MA12 - Wetlands, Stream Enhancement, and Water Source Development

Conduct pre-project surveys to provide buffers for the protection of Special Status Species. Sign or fence wildlife waters if necessary to prevent trampling and site degradation from horses or livestock.

MA13 to MA17

Restrict access to sensitive areas during specific seasons. Conduct pre-project surveys to provide buffers for the protection of Special Status Species. Assess the compatibility of treatments with Special Status Species and sensitive plant locations. Plan the size, location, and extent of management action to minimize adverse impacts. Plan treatments to allow for seed set for Special Status Species. Clean equipment prior to entry onto and off the NBHMA to avoid spreading noxious weeds. Comply with Noxious Weed EIS (1986 and 1987) and utilize methods appropriate to limit the introduction and expansion of noxious weeds. Where livestock grazing is employed, impacts to CWTD habitat would be monitored and systems modified as needed to meet vegetation goals for CWTD. Certain areas would be excluded from grazing due to inoperability or critical concerns such as Special Status Plant areas (Figure 11).

Issue: Recreational Use and Facility Development

This issue is concerned with what recreation uses would be considered compatible with the goals of the NBHMA and how public use would be accommodate.

MA1 - Roads

For user safety, roads which are decommissioned should not create undo barriers for recreationists.

MA2 - Trails

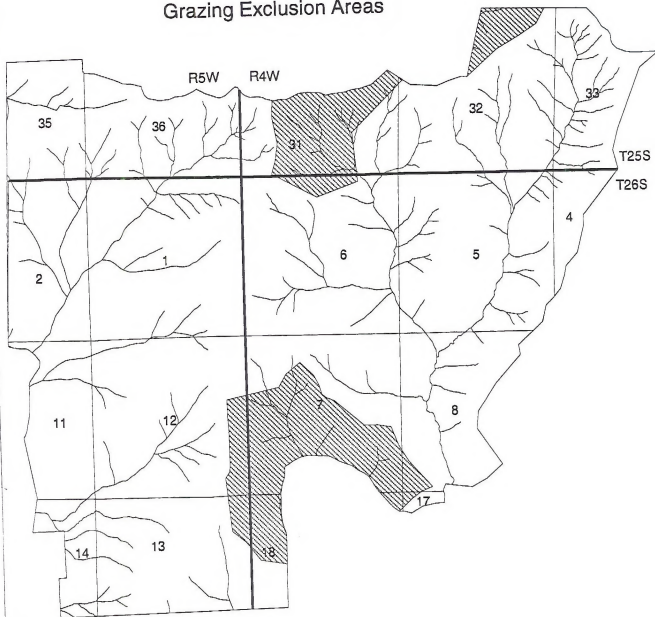
Although hikers, horseback riders, mountain bikers, and others would be allowed to travel cross-country, users would be encouraged to use roads and trails by maintaining them, providing directional signs at crossroads, supplying trail maps, and posting "Leave No Trace" ethics on information boards. Future trails may be constructed to avoid user conflicts, safety hazards, and sensitive areas. Trails would be constructed in accordance with the BLM trail handbook (H-9114-1). Input by resource specialists would be used in the trail planning process. Construction would be mitigated to minimize soil erosion. New trails would be constructed to encourage the use of the trails only, reduce conflicts between different users, provide alternate routes around sensitive areas, and to avoid potential safety hazards.

Restrictions on the season of use, type of use, number of users, or location of use may be imposed as a mitigation measure if the area's primary goal of protecting CWTD and Special Status Species is not being met.

MA3 - Pullout Parking

Up to five pullouts would be extended a maximum of 50 feet onto the ACEC property to improve public access and reduce safety problems during loading / unloading vehicles and parking. Parking and overnight camping in self-contained RV units would be allowed at the pullout. "Leave No Trace" ethics would be posted at each site. Restrictions on use may be imposed if the area's primary goal is not being met or if vandalism and sanitation problems arise.

Figure 11 North Bank Habitat Management Area
Grazing Exclusion Areas



Legend



Streams
Grazing Exclusion Areas - 740 Acres

Scale 1:37000
0.5 0 0.5 1 Miles

Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



MA4 - Public Access

Parking areas constructed at the Main Barn pavilion, West Gate, and Doc's Landing would increase access and decrease safety hazards to users while loading and unloading vehicles and horse trailers. Vandalism along County Road 200 may be avoided by providing off-road parking facilities.

MA5 - Main Barn Pavilion Development

Development would take place on approximately two acres of land where parking and structures have already existed. A group shelter with a cement floor, four picnic tables, and BBQ pit would be constructed. Additional picnic tables may be placed outside of the shelter for use during good weather. A double vault toilet would be installed to meet public needs and contain waste. ADA accessible standards would be met at the parking area and restrooms.

A water tap would be developed for horse users. If water does not meet state health standards, it would be posted as non-potable. A manure bin would be established to contain horse waste in the area. A roof would be built over the bin to prevent water accumulations. Manure would be disposed of by hauling off site or at a non-impacting spot on the ranch.

An information board and camper registration box would be placed near the barn shelter to inform the public about the area's resources and management restrictions. Additional interpretive material would be posted to provide an opportunity to learn about and better appreciate the unique resources found on the property. Signs, fencing, or a gate would be used to restrict motorized access beyond the parking area. The front gate to the Main Barn would be locked each evening to promote security and reduce impacts to CWTB. Hours for the gate closure would be posted. With proper registration, primitive campers may park overnight in the parking lot.

MA6 - West Entrance (School Bus Turnaround) Development

The development would take place on approximately 1.5 acres of previously undisturbed land. Moving the parking facility to an area visible from County Road 200 would improve public safety and minimize vandalism and inappropriate uses. The parking site would be selected to avoid Special Status Species. A single vault toilet would be established to meet public needs and confine wastes. It would be more aesthetically pleasing to users and more vandal resistant than portable toilets. ADA accessible standards would be met at the parking area and toilet. An information board would list the area's regulations, provide a map of the area, and provide space for interpretive material. A registration box would be available for campers. Signs, fencing, or a gate would be used to restrict motorized access beyond the parking area and prevent resource damage. The site would be designated as day use, however, properly registered campers may park after dark. If problems arise, the area would be gated at night to restrict access.

MA7 - Doc's Landing Development

The development of a parking area would alleviate the current unrestricted parking on natural surfaces. The concrete boat ramp would be constructed to accommodate fire suppression equipment. It would be available for use by the Glade Rural Fire Department in addition to recreational river access and other management activities. A single vault toilet would be located near the parking area to accommodate public needs and contain wastes. The restroom and parking facilities would meet ADA accessibility standards. The site would be designated as a day-use area. No vehicles or public use would be allowed after dark. If problems arise, the area would be gated at night to restrict access.

MA8 - Watchable Wildlife Sites

Watchable wildlife sites could include an interpretive panel, brochures, bench seats, and blinds adjacent to an area frequented by fish, birds, or other wildlife. It would be located adjacent to a use area where minimal impacts would occur on wildlife or its habitat. Education efforts would be directed at informing the public on ways to lessen impacts on plants, wildlife, and important habitat. They would also provide information to enhance public understanding and appreciation of the area's resources. Specific site selection and development would undergo review from resource specialists.

MA9 - Primitive Camping

Registration would be required for primitive camping on the property and camping in self-contained units in the gated pullout. Registration boxes would be located at the Main Barn pavilion and West Entrance. Registration could include the name of the lead person, number in the party, home address, arrival time, expected departure time, vehicle type, license plate number, and purpose for the visit. This information would improve user safety, assist in the event of an emergency (e.g., the user becomes lost, therefore does not depart on time), and help the BLM monitor use of the area. Information boards would inform users on "Leave No Trace" ethics for horse use, fire use, campsite use, trash, and sanitation (USDA Forest Service, 1987). Campfires would be restricted in dry season to prevent wildfires according to Douglas Forest Protection Agency restrictions.

MA10 - Environmental Education

In addition to basic regulatory information and orientation material, interpretive panels would be established. Educational topics may include ecosystem relationships, information on unique species in the area, management techniques being applied on the area, and/or historic uses of the area. The information would enhance user knowledge and appreciation of the area's resources. Programs geared for schools would also be developed. In addition, panels, handouts, brochures and slide programs may be developed. Partnerships could be developed with schools and conservation groups to enhance environmental education on the property. These partnerships could include assisting monitoring efforts and maintaining structures for wildlife (MA19).

MA11 to MA19

Interpretative information would be available to explain management actions taking place on the property. This would improve public understanding of vegetation management being conducted to enhance conditions for CWTB and other Special Status Species.

Issue: Water Quality and Quantity

This issue is concerned with how management activities would affect water quality and quantity.

MA1 - Roads, MA2 - Trails

Maintained roads would be used primarily for administrative vehicle traffic, recreation, and fire control. Non-maintained roads would be used trails for recreation and management use. These trails would have improved drainage or be decommissioned, but overall would have minimal maintenance and remain open mostly by the passage of users. In the event of an emergency, all potential access points could be used. Generally, the following measures would be used to reduce erosion and hydrology problems associated with roads and to meet BMP standards. Where appropriate:

- Construct driveable, low maintenance drain dips to limit water diversion.

- Place aggregate surfacing onto road segments with winter travel.
- Stabilize unstable road cuts and fills.
- "Harden" wet areas by using rock aggregate and geofabric.
- Avoid using unmitigated road segments that traverse wetland areas until dry conditions exist.
- Minimize surface erosion by using a grass or gravel surface.
- Provide adequate spacing of drainage features to avoid an accumulation of water in ditches.
- Use 100-year theoretical flood stage for criteria for developing culverts and stream crossings.
- Replace undersized culverts and repair damaged culverts and downspouts.
- Place dissipators on outfalls of culverts, where needed, to dissipate water energy and reduce erosion and scouring.
- Confine in-stream culvert placement to July 1 to September 15.
- Where possible, re-route road segments that are impacting stream channels and avoid trails in riparian areas.
- Avoid using road segments that traverse wetland areas until dry conditions exist.
- Seed cutbanks and fillslopes where potential erosion and sedimentation problems exist.
- Protect fragile soils and soils susceptible to erosion.
- Till with a winged subsoiler and revegetate surfaces for erosion control. Use a variety of species for seeding.
- Monitor trails for resource impacts and adjust season, type, and number of users as necessary to avoid resource degradation. Adjust use, or make segment closures as necessary.
- Avoid concentrated horse activity in wetland or water saturated areas. If necessary, impose closures or limits on the number of users or season of use to avoid resource degradation.
- For authorized state and federal personnel using motorized vehicles for management or research activities, unsurfaced roads would be used by standard vehicles only during dry conditions (usually May 15 to October 15).

MA5 - Main Barn Pavilion Development

The manure bin and vault toilet would be sealed to prevent water contamination by leaching. Both would be periodically checked and pumped. The toilet would be a minimum of 100 feet from Jackson Creek. Parking would be prohibited along the stream bank; parking barriers can be used to protect the stream bank. To protect hydrology functions, the parking area would not cut into the hillside. The parking area would be designed to avoid concentrated drainage onto the stream bank, or into the creek. Design features would include outslipping and a gravel parking lot to reduce runoff.

MA6 - West Entrance Development

The vault toilet would be sealed to prevent water contamination by leaching.

MA7 - Doc's Landing Development

The vault toilet would be sealed to prevent water contamination and placed a suitable distance from the North Umpqua River. Developments would be designed to reduce erosion, soil damage, and disturbance of the natural hydrologic functions of the area.

MA9 - Primitive Camping

Implementation of the "Leave No Trace" program would reduce sanitation, compaction and trampling problems at sites used for camping by teaching low

impact camping techniques and etiquette. It would also protect riparian areas by prohibiting camping within 50 feet of a stream. Campfires would be restricted in dry season to prevent wildfires.

MA12 - Wetlands, Stream Enhancement, and Water Source Development

Locate water sites to minimize adverse affects on stream channel stability, sedimentation and in-stream flows necessary to maintain riparian resources, channel conditions and aquatic habitat. Perform stream construction activities from July 1 to September 15 and perform other water developments during the dry season (approximately May 15 to October 15) or as conditions allow. Avoid reduction of downstream flows that would detrimentally affect aquatic resources, fish passage (where applicable), or other uses. Involve other resource specialists during the planning and site selection stages of development in addition to the project conformance review.

MA13 to MA18

These are general guidelines for BMP which would be used to reduce erosion, compaction, and degradation of water quality. Site specific recommendations would be made as specific project locations and management techniques are developed. Projects would undergo a project conformance review to ensure that proper mitigation measures have been incorporated. For additional details on Best Management Practices, see RMP, Appendix D.

Burning would be conducted under conditions that would minimize adverse impacts such as erosion. Burns would be done under conditions that result in low intensity fires that would leave plant roots intact. Sites with over 65% slope and sparse vegetation would be avoided. A large percentage of the nutrient capital and other beneficial soil and forest floor properties would be protected by using low to moderate intensity fires on appropriate soils. BMP guidelines would be used to establish and decommission fire trails.

During aerial fertilization applications, provide a streamside buffer of 100 feet minimum on both sides of the stream channel for intermittent and perennial streams. For ground based applications, a 25-foot buffer on perennial and intermittent streams would be maintained. If the treatment is within 0.75 miles of domestic water intake, adjacent landowners would be notified prior to the fertilization date. All noxious weed control applications would comply with the Noxious Weed EIS (USDI 1986 and 1987).

Mechanical procedures for planting or cutting areas would be done with equipment appropriate to maintain soil productivity and avoid compaction. Techniques such as contour plowing or no-till seeding would be used to minimize potential erosion. Livestock would be dispersed across the area by the use of salt licks and water sources away from riparian areas. Livestock grazing methods would comply with Riparian Reserve standards and guides (RMP 1997, Biologic Opinion; Riparian Reserve Standards and Guidelines). The season, duration, rotation plan, number of animals, and location of grazing areas would be controlled to reduce impacts to desirable vegetation, soil, riparian reserves, or water resources.

Due to the young age of the timber on the NBHMA, timber harvest on the 400 acres specified for timber production is not anticipated. Incidental harvest as the result of vegetation management would undergo conformance review and meet BMP standards as determined by interdisciplinary review.

Issue: Riparian / Wetland Habitat

This issue is concerned with how management activities would affect riparian / wetland habitat. Much of this concern is covered under the previous issue of water quality and quantity.


MA1 through 3 and MA5 through 7 Developments

Any development that takes place within riparian areas would take appropriate measures to minimize disturbance to riparian habitat.

MA9 - Primitive Camping

Implementation of the "Leave No Trace" program would reduce sanitation, compaction and trampling problems at sites used for camping by teaching low impact camping techniques and etiquette. It would also protect riparian areas by prohibiting camping within 50 feet of a stream.

MA13 through 18 Habitat, Timber and Vegetation Management, MA19 Forage Plots
Management activities (other than riparian enhancement projects) would observe the same riparian buffers for treatment of noxious weeds (see page 17). Harvest of timber within the timber areas would observe the full NFP/RMP prescribed riparian buffer.



Chapter Three

The Affected Environment

Introduction

This chapter describes the conditions currently existing on the NBHMA. This allows the reader to better understand the changes and effects caused by implementing one of the three management alternatives. First, the basic physical setting, climate, topography, and soils are described. Then the history of the area and cultural values are characterized. Resources identified, but not significant on the area, are then delineated. The chapter concludes by presenting the existing conditions of each of the four key issues presented in Chapter One and Chapter Two. Many of the characteristics of the NBHMA presented below were transcribed or summarized from the North Bank Watershed Analysis (Roseburg District BLM, 1997).

Physical Characteristics

The NBHMA contains approximately 6,581 acres of land. The average annual rainfall is between 34 and 38 inches. Approximately 86 percent of the precipitation occurs from October to April. Summer maximum temperatures are typically in the low 80's°F and winter minimum temperatures are typically in the mid 30's°F; the annual temperatures average 54°F. The landscape is dominated by a mix of grasslands, oak savanna, oak woodlands, and younger conifer stands. The grasslands and oak/savanna woodlands seem to have dominated this landscape in the past as a result of soil types and fire regimes. The young conifer stands are a result of harvesting the older timber stands during the last 100 years and natural seeding to Douglas-fir.

Roseburg volcanics and associated sedimentary deposits form the major geologic features of the area. The topography of the NBHMA is dissected hills with moderately steep slopes (30 to 60 percent). Elevations range from 520 feet at the North Umpqua River to 1,980 feet at the headwaters of Jackson Creek. The topographic relief from the drainage bottom of the major creeks to the adjacent ridge tops is typically 500 to 900 feet. Slopes greater than 60 percent may comprise as much as 5 percent of the watershed analysis unit (WAU). The watersheds of Chasm, Jackson, and Whitetail Creeks comprise a large portion of the NBHMA and have significant floodplain and fan deposits of very deep alluvium in the lower reaches. Many stream channel segments of these creeks and their larger tributaries are deeply incised with near vertical banks of 8 to 20 feet.

About 90 percent of the area is composed of clayey and very clayey soils high in montmorillonite (National Cooperative Soil Survey of Douglas County, Natural Resource Conservation Service). Montmorillonite is a type of clay with high, moisture related shrink-swell capability. Deep cracks commonly form in these soils during the dry season then seal up during the wet season with very slow moisture infiltration and permeability. These soils exist in both upland sites (colluvial soils and soils formed over bedrock) and valley bottoms (alluvium). Their depth ranges from very shallow (<10 inches) over hard basalt to very deep (>60 inches). High organic matter content typically extends deep down the soil profile.

The upland soils are typically well drained and have a xeric (dry) moisture regime. A large percentage of soils in riparian zones, floodplains and fans are moderately well drained to poorly drained. In poorly drained soils, water tables are near or at the surface for lengthy periods of the year. Soil depths ranging from very shallow to very deep are all well represented at the upland sites. Shallow and very shallow soils over hard bedrock are common but possibly not quite as extensive as the Soil Survey indicates based on site investigations. Soils are typically very deep in the valley bottoms.

About 90 percent of the soils have high runoff potential. Soils high in montmorillonite clays, shallow and very shallow soils over hard bedrock and poorly drained soils account for the high percentage. A mineral report for the NBHMA indicated the land has low potential for locatable minerals, geothermal resources, or oil and gas (Exchange EA, 1993, ROD page vii).

Historical Setting and Impact on the Area

Prehistoric use of the area appears to have followed a pattern similar to that observed over much of western North America. The initial occupation was perhaps by the transitory Clovis peoples who focused on the hunting of big game, such as mammoth and ground sloth. As time passed and the big game populations disappeared, the people broadened their resource base to include many plants and animals. They became more sedentary, eventually aggregating in pithouse villages.

Although Native Americans did impact the area's landscape through the use of fire, the extent is unknown. For thousands of years Native Americans burned off the river bottoms and valley areas where they had resided. This is substantiated in historical documentation from the 1851 Diary of George Riddle. "In all the low valleys of the Umpqua there was very little undergrowth, the annual fires set by the Indians preventing young growth of timber." The NBHMA lands were probably burned on a regular basis in the past, first by Indians and then later by homesteaders.

Euroamerican settlement became more active in the mid-nineteenth century. Much of the NBHMA passed into private ownership through the provisions of the Land Act of 1820. By 1870, the NBHMA was essentially owned by two individuals with an east-west split of the ownership. It came into single ownership in the 1880's. In the early 1990's, the Roseburg District began to look at ways to secure the Columbian White-tail deer habitat that would make the de-listing of the species possible. The property was acquired by trading 360 acres of BLM timberland for the Dunning Ranch. The property passed to public ownership managed by the BLM in 1994.

While in private ownership, the land was primarily used for livestock grazing since the steepness of the terrain made it unsuitable for crop production. Although no exact records have been found, the area may have been used for livestock grazing for most of the last 145 years. This also impacted the landscape as grasslands were subjected to grazing by cattle and sheep. Exotic vegetation was introduced by planting non-native pasture grasses and through the spread of weed species. Fire use was reduced, although it was used on a more regular basis on the eastern portion of the area for cattle forage enhancement. The area was intensively logged from the 1960's, thus few older trees exist on the area. Some timber stands were converted to pasture/grasslands.

Prior to the early 1960's, there was very little development along North Bank Road from Wilbur to Glide. Land ownership in the area along North Bank Road consisted primarily of five or six major ranches. As access increased into the North Bank area, several portions of ranches were sold to developers and rural residential development began. On properties surrounding the NBHMA, many segments along the North Umpqua River have been developed. The riparian area is key habitat for CWTID, especially during the summer when water in the uplands dries up. In addition to natural riparian vegetation, the deer are now attracted to the succulent forage created by hay fields and residential landscape plantings. The deer browse these enough to cause plant damage. The problem is compounded by the fact that some landowners attract deer into their yards by providing food, thus further encouraging the deer to concentrate and stay in residential areas. Concentrating in residential areas makes the deer more susceptible to disease, in-breeding and vehicle related mortality.

Since BLM acquisition in 1994, no grazing, controlled burning, or logging has occurred. This has resulted in some components of CWTD habitat improving and some habitat components declining, depending on the vegetation type. Some riparian areas have improved while much of the grass and grass/forb areas are declining. Several years of annual growth with no grazing or prescribed fire has resulted in grasslands with thick, dense mats of dead vegetation reducing forage value to CWTD. New annual growth in these areas is much reduced and deer seldom forage on grasslands mixed with old dead vegetation. Shrub lands have expanded and conifers have continued to encroach into hardwood areas making those areas less desirable to CWTD. The North Bank WA contains a more detailed description of the historical setting of this area.

Resources Identified, but Not Used for Planning

The federally listed northern spotted owl (endangered) and marbled murrelet (threatened) are unlikely to nest on the property (Exchange EA and Decision Record for the NBHMA 1993, Watershed Analysis 1997). For these species, nesting opportunities are limited by the lack of adequate habitat, habitat fragmentation, or distance from foraging areas. Because nesting opportunities on the NBHMA are unlikely for these species, they were not considered during the planning process.

Bald eagles (federally threatened) have been observed on the area during the winter with a historic nest site and active nest within 2.5 miles. As the Decision Record and consultation with the USFWS noted (Exchange EA, ROD, 1993, page vii), public ownership of the NBHMA would not likely have an adverse affect on the bald eagle and would have a positive benefit in securing winter habitat and potential nest sites. Since the species was not nesting on the area and all alternatives secure winter habitat and potential nest sites, the bald eagle was not considered further in the planning process.

Existing Conditions for each Key Issue

Columbian White-tailed Deer and Special Status Species

Columbian White-tailed Deer

The CWTD occurs throughout the NBHMA and surrounding areas. It is currently listed as a federally endangered species; however, it has been proposed for delisting (Federal Register: May 11, 1999 Vol. 64, Number 90, pages 25263 - 25269). The state de-listed the CWTD from endangered to sensitive in 1995 (November 1995 ODFW Commission meeting).

The Roseburg population of CWTD has fluctuated widely in the past (Figure 12). Severe weather has been known to impact CWTD. An abnormally long period of sub-zero temperatures with deep snow cover during the winter of 1969-1970 contributed to a population decrease at that time. CWTD have since recovered and currently exceed 5,900 animals in the Umpqua Basin (ODFW report, unpublished). Currently, CWTD are found from Myrtle Creek in the south, to Elkhead in the north past Glide on Highway 138 to the east and south along the bottom lands of Little River. The population has expanded its range to Umpqua and possibly beyond to the west. Despite the apparent increase in population and the acquisition of secure habitat, several factors could still affect the Roseburg population. Research and annual inventory work throughout the range shows that reproduction is very low (Kistner and Denney, 1990, page 6) and fawn survival during the first month of life is less than 50% (Ricca and Jackson ODFW 1996 & 1997 field work).

Since the BLM acquired the NBHMA, considerable effort has been focused on gaining more knowledge on CWTD. Much of the effort has occurred on and near

the NBHMA. Two graduate research projects through Oregon State University (OSU) are nearing completion and another graduate research project has just begun. Besides those formal research projects, ongoing activities involving CWTD include: genetic analysis (Texas A & M University), a fawn mortality study (ODFW), a capture and relocation trial (ODFW), a deer health study conducted by the National Wildlife Health Center in Wisconsin, and necropsies of deer. Some findings include: (1) fawn survival is low and there is evidence that some fawns are being abandoned by their mothers; (2) necropsies of deer indicate most adult deer, both male and female, have very low fat reserves and are considered in poor physical condition; and (3) female deer with fawns have virtually no fat reserves (pers. comm. T. Hensley, USDA Veterinarian). Examination of a CWTD fawn from an area with better forage conditions revealed apparently normal internal deposits of fat (pers. comm. T. Hensley). NBHMA white-tails are eating low quality forage such as rushes. Internal and external parasites are abundant. CWTD tend to concentrate in the creek bottoms during the dry seasons. Collectively, the information suggests CWTD are at a population density that is at the upper end of the carrying capacity of their existing habitat.

Animals in a poor nutritional state are more susceptible to diseases, parasites, and the effects of extreme weather. While diseases such as blue tongue and epizootic hemorrhagic disease have been mentioned as potential threats to the deer (Kistner and Denny, 1990) there is no record of these diseases causing any problems in the area. Likewise, there is no evidence that disease transmission between livestock and deer has ever been a problem in Douglas County.

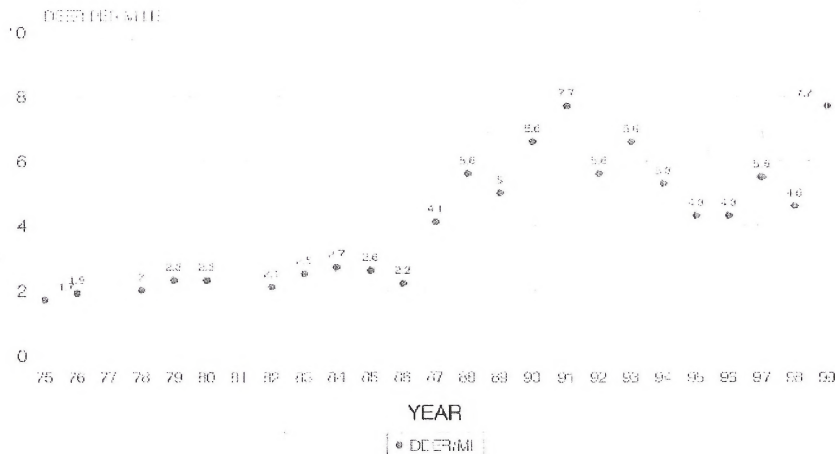
Since the NBHMA was acquired, an attempt has been made to inventory CWTD numbers with the use of Forward Looking Infra-red scanners (FLIRS) in a helicopter. FLIRS counts have estimated the NBHMA has a population of 152 to 212 animals and a density ranging from 11.1 to 14.8 animals per square mile. Population trends are monitored within the current range of the CWTD. The North Bank Road is included in the inventory. Data indicates that CWTD numbers increased in the mid 1980's and have remained relatively stable during the 1990's (Figure 12).

Research and personal observation by wildlife biologists indicate that the principle habitats utilized by CWTD are oak savanna/oak woodland types and riparian areas associated with oak complexes as the preferred habitat. Preliminary research conducted on the NBHMA confirms the association of CWTD to riparian and riparian/oak habitats (Black, personal communication). This habitat type occurs principally in lower elevation areas throughout the Umpqua Valley and makes up approximately 30% of the NBHMA. Portions of the hardwood/conifer type also contribute to this high CWTD use area making the actual percentage over 30%. Oak savanna and woodlands are also desirable for development or ranching. Commercial and residential development, plus clearing for pasture and firewood, has heavily impacted the oak habitat found in the valley. This process appears to have accelerated during the last 15 years throughout the range of the Roseburg population of CWTD, including areas near the NBHMA.

The cessation of management practices such as grazing and burning during the 1994 through 1999 period have allowed vegetative changes to take place. During this period, thatch has built up in grassland areas resulting desirable forbs and grasses being covered or out competed. This has resulted in a loss of forage for CWTD. In addition, thatch layers appear to retard fall and spring green up and availability of important forage plants by insulating soils and eliminating light required for many plants to initiate growth. Along with this, is the increasing invasion of undesirable shrub species, most notably one-seeded hawthorne (*Crataegus monogyna*). This shrub tends to form impenetrable thickets that reduce forage for deer. Within the oak woodland areas, conifer seedlings have established

Figure 12

CWTD SPRING TREND



and will dominate oak areas if not controlled. In the meadow areas, significant cedar encroachment is taking place and will eventually cover suitable forage areas. All of these responses to lack of management have reduced forage for CWTd. (Pers. Obs. G. Mires, BLM: M. Black, ODFW)

Along with the direct loss of habitat is the apparent slow regeneration of white oak woodland which are believed to have contributed to the decline in the CWTd population. Based on preliminary work done in the NBHMA, there is very little evidence of established seedlings within the areas that have been surveyed. The key to maintaining a viable population of CWTd within the analysis area is to ensure that the NBHMA is managed to maintain or develop habitat types that will support healthy CWTd. Preliminary results from recent research indicate that CWTd rely heavily on plant species that are associated with moist growing sites. This is most dramatic during the late summer and fall time periods which are quite dry. CWTd distribution on the NBHMA is less confined during the times of year when water and green vegetation is available in the uplands (Black, personal communication).

Vegetation and Special Status Plants

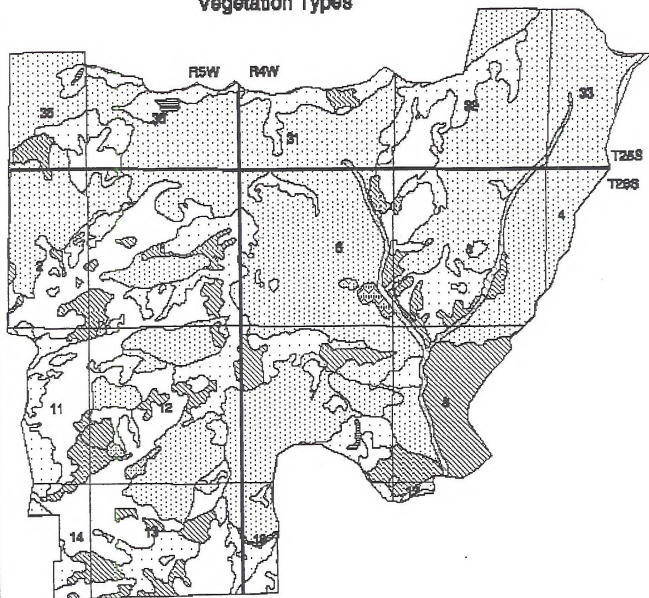
The NBHMA is composed of a mix of grasslands, oak savanna, oak woodland, and mixed hardwood-conifer forests (Table 3-1, Figure 13).

Hickman (1994) characterized the area noting that uplands with the best soils contained, "... coniferous forests of Douglas-fir and subordinate species such as Pacific madrone, big leaf maple, California black oak, ponderosa pine, incense cedar, and sometimes Oregon white oak. Drier type soils in the uplands support hardwood dominated stands of Pacific madrone, Oregon white oak, and sometimes California black oak, but may also contain minor amounts of Douglas-fir, ponderosa pine, and incense cedar. Some shallow slopes support only scattered Oregon white oak and grass or shrubs such as wedgeleaf ceanothus and Pacific poison oak ...". "This zone is separated ecologically from the adjacent vegetative zones by its dry, warm climate, the high proportion of hardwoods in the uplands and the absence of indicator species from the Grand Fir Zone." Limited ground surveys have noted that the oaks are typically greater than 100 years old. Dense oak woodlands are undergoing competition mortality, with little regeneration. Conifers are young to mature and typically under 40 years old since most of the conifers were logged off in the last 30 to 40 years. Conifer regeneration is

Table 3-1. Vegetation types on the North Bank Habitat Management Area
(Calculated by GIS information and proportionally adjusted to add up to the 6,581 acres recorded in county tax records.)

Vegetation	Acres	Percent of Landscape
Rock Outcrops	17	0.2
Grassland & Improved Pasture	1208	18.4
Oak Savanna	677	10.3
Oak Woodlands	1152	17.5
Hardwood/Conifer	3413	51.9
Riparian areas	78	1.2
Wetlands	36	0.5
Total	6581	100

Figure 13 **North Bank Habitat Management Area**
Vegetation Types



Legend

- Grass Lands
- Hardwood/Conifers
- Oak Savannah
- Oak Woodlands
- Riparian
- Rock Outcrops
- Wetlands

Scale 1:37000
0.5 0 0.5 1 Miles

Information used for this map was produced using GIS from the North Bank Watershed Analysis



abundant in forested habitats. Although nearly 52% of the area is hardwood/conifer "forests," much of this is actually composed of scattered mature oaks, hardwoods, and younger conifers overtopping grasslands with a brush component. Denser conifer stands exist, mostly on north-facing slopes or in larger draws. A timber appraisal noted that hardwood stands contained about 111 trees per acre (tpa), averaged 11.1 inches in diameter at breast height (DBH) and were 64 feet to the commercial top. Conifer stands had 32 tpa, were 14.3 inches in DBH and were 49 feet to a commercial top. Mixed stands contained 77.4 tpa, averaged 12.7 inches in DBH and were approximately 60 feet to the commercial top.

Botanical surveys were conducted on the NBHMA shortly after it was acquired by the Bureau. One hundred and four exotic plant species were identified. Non-native species are so widespread that few patches of native plant assemblages were identified. The overstory component consists of primarily native species, but the grass layer is dominated by non-native grasses and some highly undesirable non-native forbs are widespread. Some of the more common examples are: Medusahead (*Taeniatherum caput-medusae*), Tall fescue (*Festuca arundinacea*), Dog-tail grass (*Cynosurus echinatus*), field hedge parsley (*Torilis arvensis*), subterranean clover (*Trifolium subterraneum*), and common vetch (*Vicia sativa*). Appendix 2 contains a list of plants found on the NBHMA. Thirteen particularly undesirable plants classified as noxious weeds have been identified (Table 3-2). Several patches of noxious weeds (mainly thistle and Scotch broom) exist and tansy ragwort, Italian thistle, Canada thistle, milk thistle, and St. John's-wort are common and widespread.

Table 3-2. Noxious weed species on the North Bank Habitat Management Area.

Family	Species	Common Name
Asteraceae	<i>Carduus pycnocephalus</i>	Italian plumeless thistle
	<i>Centaurea solstitialis</i>	yellow star-thistle
	<i>Cirsium arvense</i> var. <i>horridum</i>	Canada thistle
	<i>Cirsium vulgare</i>	bull thistle
	<i>Senecio jacobaea</i>	tansy ragwort
	<i>Silybum marianum</i>	milk thistle
	<i>Xanthium spinosum</i>	spiny cocklebur
	<i>Centaurea pratensis</i>	Meadow Knapweed
Convolvulaceae	<i>Convolvulus arvensis</i>	field morning-glory
Equisetaceae	<i>Equisetum telmateia</i>	giant horsetail
Fabaceae	<i>Cytisus scoparius</i>	Scotch broom
Hypericaceae	<i>Hypericum perforatum</i>	common St. John's-wort
Poaceae	<i>Taeniatherum caput-medusa</i>	medusa head rye

Eleven special status plant species are known to occur on the NBHMA (Table 3-3). Red root yampah, Howell's false caraway, Hitchcock's blue-eyed grass, saw-toothed sedge, and firecracker plant occur in meadow and oak savanna habitat. The shrubby rock cress grows on basaltic rock outcrops. A portion of its habitat has already been lost due to quarry development and habitat has been impacted by wildfire. The coffee fern occurs on mossy covered rock outcroppings in two locations. The mistmaiden grows in open areas with shallow soils which are rocky and retain moisture. Popcorn flower occurs in open vernal wetlands and the crumia moss grows on rocks along streams. Olney's sedge occurs along meadow edges and in riparian hardwood forests.

Other Special Status Wildlife

The NBHMA contains a wide diversity of habitat types. This mosaic of grassland, savanna, mixed conifer, and oak woodland habitat creates ideal conditions to support a diversity of wildlife species. There are approximately 216 vertebrate species present on the NBHMA of which 135 are bird species which use or are expected to use the NBHMA (Appendix 3). Some species use the area for nesting, other species use the area during the winter and still others use it during migration or dispersal from natal nest sites. Twelve of the avifauna species are species of management concern (Appendix 1). Of these, the Vaux's swift, acorn woodpecker, northern pygmy owl, pileated woodpecker, purple martin, and western bluebird require forest conditions that favor mature trees with snag and cavity development. There are also three federally listed species: the bald eagle, marbled murrelet, and northern spotted owl. Bald eagles winter on the area, nest within three miles of the property, and could eventually nest on the NBHMA. The NBHMA is outside the range of the marbled murrelet. There are three historic or current northern spotted owl nest sites within two miles of the NBHMA. Golden eagles are frequently observed utilizing the NBHMA. They are protected by the Bald Eagle Protection Act (16 U.S.C. && 668-668d, June 8, 1940, as amended 1959,

Table 3-3 Special Status Plant Species on the North Bank Habitat Management Area

Family	Species	Common Name
Apiaceae	<i>Perideridia erythrorhiza</i>	red root yampah
	<i>Perideridia howellii</i>	Howell's false caraway
Brassicaceae	<i>Arabis koehleri</i> var. <i>koehleri</i>	shrubby rockcress
Boraginaceae	<i>Plagiobothrys hirtus</i>	popcorn flower
Cyperaceae	<i>Carex gynodynamis</i>	Olney's hairy sedge
	<i>Carex serratodens</i>	saw-tooth sedge
Hydrophyllaceae	<i>Romanzoffia thompsonii</i>	Thompson's mistmaiden
Iridaceae	<i>Sisyrinchium hitchcockii</i>	Hitchcock's blue-eyed grass
Liliaceae	<i>Dichelostemma ida-maia</i>	firecracker plant
Polypodiaceae	<i>Pellaea andromedaefolia</i>	coffee-fern
Pottiaceae	<i>Crumia latifolia</i>	crumia moss

1962, 1972 and 1978). In addition to the above species, the Bureau also manages for other raptors. From 1983 to 1994, winter raptor surveys were done in the vicinity. During the time surveys were conducted, it was noted that the number of raptors per mile was highest along County Road 200, part of which traverses the NBHMA. Rural residential development near the NBHMA increased during this time period, the magnitude of which appears to have had an adverse impact on raptors in the lower elevations (Watershed Analysis 1997). Adverse impacts to wintering raptors within the NBHMA has resulted from vegetative change that has taken place in the grassland areas. As a result of increased grass height and thatch buildup, prey species that are active in the winter have become less available to raptors. This condition persists throughout the year but is most noticeable during the winter months when many raptor species tend to congregate in the lowland areas (Mires, personal observation).

Neotropical migrants such as swallows, thrushes, vireos, flycatchers, and warblers are also a group of management emphasis for the BLM. Currently, little is known about the status of most of these bird species on the property or their status in oak woodland habitats throughout the Umpqua Valley (Cross and Simmons, 1983). The habitat requirements for these species varies widely. Some of these species require fairly large, contiguous blocks of either grassland or forest habitat for successful nesting. Other species prefer smaller patches of habitat which contain more edge. Pre-project clearance surveys and specific research/monitoring projects will help provide information on the distribution and status of these species on the property.

Of the 55 mammal species which have been documented on the property or are likely to occur (Appendix 4), 12 are listed as species of management concern (Appendix 1). In addition to the CWTD, bats, the ringtail, and red tree vole were considered in the analysis of each alternative (Appendix 1). The specific habitat needs of the bats vary by species, but generally include a need for older stands of timber and water. As noted previously, most of the conifer stands on the NBHMA are young; however, most of the oaks are 100 or more years old. As these areas mature, the addition of more cavities and loose bark will be beneficial to most bat species. Ringtails prefer rocky cliffs or canyons near water. This habitat type is limited on the NBHMA especially during the dry season as upland sources of water become dry. Although the red tree vole is an old-growth associate (Thomas, et al., 1993), it has been documented on the property in small stands of second-growth conifers. This could indicate that the vole is more wide spread than was previously thought. Overall, quantitative data on the presence and status of these species on the NBHMA is not available.

Of the vertebrate species that occur on the NBHMA, Columbian black-tailed deer, cougar, bear, and western grey squirrels are considered game animals by the Oregon Department of Fish and Wildlife (ODFW). Game birds that occur in the area include mountain quail, California Valley quail, blue grouse, wild turkey, mourning dove, band-tailed pigeon, Canada geese, and other waterfowl. Hunting on the area is regulated by ODFW. Future changes in current hunting practices would depend on both agency's management objectives and population levels of game species. Predators on the NBHMA include coyote, cougar, bear, bobcat, fox (two species), raccoon, weasel, mink, skunk, bald eagle, golden eagle, red-tailed hawk, and the great-horned owl. These predators use existing wildlife populations as their source of prey.

The NBHMA contains habitat for approximately 16 species of reptiles and ten species of amphibians of which six species are on the sensitive species list for Oregon and are also Bureau sensitive species (Appendix 1). Urban development and expanded farming operations in the Western Interior Valleys have contributed

to the decline of the shaprtail snake and western pond turtle (Puchy and Marshall, 1993). The turtle has suffered additional losses of riparian and wetland habitat. The clouded salamander likely declined in the Umpqua Valley because of forestry practices. The cause for declining populations of the foothill yellow-legged frog and the red-legged frog is unknown (Puchy and Marshall, 1993).

There are approximately nine miles of stream within the NBHMA that support fish species during part of the year. Most of these stream reaches lack flowing water during the spring and early fall. Healthy fish populations are not present within any of the NBHMA drainages (Figure 14). Jackson Creek has the greatest potential for increased fish populations, but it is limited by lack of water during the summer, limited hiding cover, and elevated water temperatures. Coho, steelhead, and cutthroat trout have been documented in Jackson Creek. The coho were of hatchery origin, suggesting that the population is not self-sustaining. Based on the current degraded condition of the NBHMA's streams, it is unlikely that fish habitat or production will improve without active in-stream and riparian restoration.

In summary, the diversity of habitats present on the NBHMA contributes to the diversity of animals present on the property. Rural developments and agricultural expansion is expected to continue within the Umpqua Valley and oak savannas will continue to be lost and not replaced (Puchy and Marshall, 1993). As the habitats surrounding the NBHMA are altered by human activities, the value of the NBHMA will increase in terms of providing secure habitat for wildlife. Oak savannas and oak woodlands may become increasingly rare in the valley's landscape, yet these areas provide important habitats for over 140 species of wildlife (Gumtow-Farrier and Gumtow-Farrier, 1992).

The NBHMA provides potential reproductive, forage and/or passage habitat for 34 animal species of special concern. It also provides the necessary requirements for six plant species of special concern. This high number of special status species led to the designation of the area as an ACEC to protect or enhance habitat for those special status species occurring or potentially occurring on the property.

Recreational Use and Facility Development

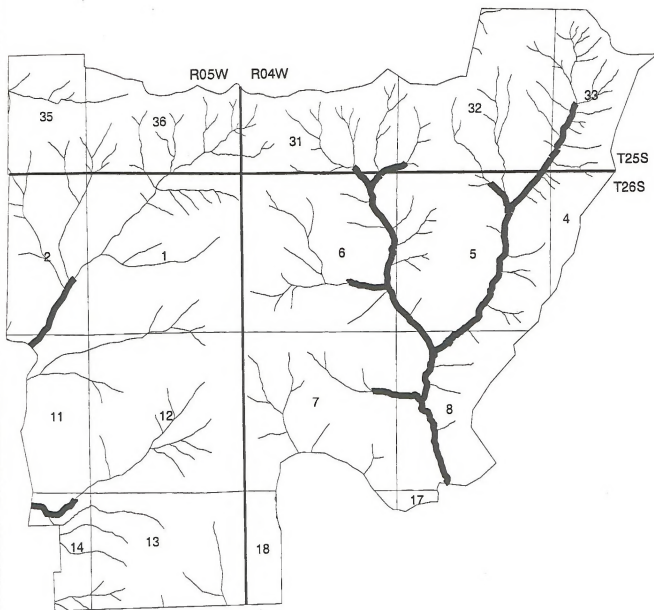
Recreational Use

Public access is by foot, horse or bike; only non-motorized recreation is allowed. Hikers, mountain bikers, bird watchers, hunters, and equestrian users have been observed using the area. All current roads and trails are open for non-motorized use and cross-country travel is not restricted. Public use of the area is currently at a low volume. Some camping has occurred at roadside pull-offs and in the interior of the NBHMA. Camping on the property is currently unregulated.



ODFW regulates hunting seasons on the NBHMA. Regulations are developed with the cooperation of the USFWS and BLM. Currently, North Bank is open to game bird hunting by the general public and limited permit entry deer hunting. Big game controlled hunts are limited to youth and master hunters. Future changes in current hunting regulations and practices would depend on all three agency's management objectives and population levels of game species. Use of firearms for other purposes are not permitted by BLM under federal regulations.

Loose dogs and dog training are prohibited on the NBHMA from April 1 until July 31 by Oregon Administrative Rules (635-51-048). Unleashed dogs that are used for specific management purposes by authorized personnel would be allowed with permission from the BLM.

Figure 14 North Bank Habitat Management Area
Fish Distribution



Legend

 Streams with Fish
 Streams w/o Fish

Scale 1:37000

0.5 0 0.5 1 Miles



Information used for this map was produced using GIS from the North Bank Watershed Analysis

Facility Development

Currently, facility development has consisted of conversion of the existing house to an office/meeting area, creating a pad with hookups for host trailer housing and placement of portable chemical toilets at the West Entrance and Main Barn. A school bus turnaround was constructed to improve safety near the west gate. The roads at the West Entrance and Main Barn have been graveled to improve management access. Some structures at the Main Barn site have been dismantled to reduce safety hazards. The remaining structure is an open air, covered shelter, with a dirt floor. This structure has been evaluated for structural integrity and safety. It does not meet building code for a group shelter in its current state. The west feeder barn, middle feeder barn, and east feeder barn are still present on the property (Figure 2). Hazards from loose boards, nails, and structural weakness may still be present.

Pull out parking exists in several locations along the shoulder of County Road 200. Parking in front of the gates is prohibited in order to keep the entrance points clear of obstructions for management or research access. A graveled school bus turn around exists about a quarter mile east of the Jackson Ranch and West Entrance. Pull out parking on the south side of County Road 200 requires users to cross over the road to gain access. Parking at Doc's Landing has been created by vehicles driving to the area and parking on the natural surface. Signs of soil and vegetation compaction are evident as the vehicles attempt to get as far off the road as possible.

Water Quality and Quantity

Human uses within the NBHMA dating back thousands of years have altered riparian areas and stream channels (see North Bank WA, Human Uses and Vegetation Sections). Prior to BLM management of the NBHMA, intensive timber harvest, slash burning and grazing in riparian areas was done to provide more area for grazing animals. These practices are believed to have caused the down cutting of stream channels; therefore, it is reasonable to assume that historically the riparian areas were wider, contained more diverse tree and plant communities, and had more wetland habitat than what exists today. Roads were also constructed within some riparian areas to provide access across the NBHMA.

The removal of riparian vegetation, compaction within riparian zones, and road construction have altered hydrologic processes thus limiting the recovery of stream channels. Streams have probably undergone increases in stream temperatures due to the removal of streamside shade. Increases in water and sediment delivery due to compaction, removal of riparian vegetation, and fires may actually contribute to increased water temperature. Actual changes in riparian diversity and function are not known, but streams within the NBHMA are currently degraded. The general condition of the NBHMA stream channels are characterized as follows:

1. Stream reaches that are deeply incised with some areas as deep as 20 feet.
2. Large wood to dissipate stream energy, trap sediment and gravels and form pool habitat is lacking.
3. Floodplains are lacking or existing floodplains are disconnected from streams.
4. Stream shade is lacking.
5. Wide (approximately 100 feet) riparian area to store and release water during periods of little to no precipitation are scarce.

The factors above do not necessarily occur everywhere and some stream reaches are in a *properly functioning condition* (PFC). The factors above probably contribute to stream reaches flowing intermittently or during storm events. It seems likely that historically more stream reaches flowed year-round (perennial). Climate conditions also contribute to flow conditions as the area has undergone four distinct wet/dry periods since the Roseburg weather station was initiated in the

1850's. A combination of active and passive restoration activities proposed in the EIS are proposed to improve stream and riparian condition and move aquatic conditions towards PFC over time.

The NBHMA contains parts of five drainages. Three major drainages flow toward the North Umpqua River and two smaller drainages flow into Cooper Creek Reservoir and Calapooya Creek. In the three major drainages (Chasm, Whitetail and Jackson Creeks), 40 to 99% of the drainage is contained within the boundaries of the NBHMA. Overall, there are approximately 49 miles of streams within the North Bank WAU. Of these streams, 16.5 miles have been assessed for PFC.

In 1991, the BLM Director approved the *Riparian-Wetland Initiative* for the 1990's, which establishes national goals and objectives for managing riparian-wetland resources on public lands. One of the chief goals of the initiative is to restore and maintain riparian-wetland areas so that 75 percent or more are in PFC. Another underlying objective is to provide a wide array of vegetation and habitat diversity for wildlife, fish, and watershed protection. An assessment of North Bank WAU revealed that 3.5% are in PFC with adequate vegetation, proper landform, or large woody debris to dissipate stream energy. Nearly 34% of the streams inventoried are functioning at risk with an upward trend meaning the condition is likely to improve and 11% are functioning at risk with no apparent trend. Approximately 44% of the inventoried streams were functioning at risk with a downward trend meaning that the riparian area is functioning, but some soil, water, or vegetation attributes are causing the system to be susceptible to degradation (Figure 16). Approximately 8% of the assessed streams are nonfunctional, lacking vegetation, landform, or woody debris to dissipate stream energy and reduce erosion.

Below is a summary of the current condition of three major drainages on the NBHMA:

Chasm drainage:

Survey notes indicate that a large portion of the main stream and the confluence of smaller tributaries intersecting Chasm Creek are deeply incised. Stream headcuts (a change in channel gradient due to erosion) were observed along Chasm Creek and its tributaries. The change in stream gradient due to headcutting is approximately 2 to 6 feet. There are road/stream crossing problems along Chasm Creek where undersized culverts and poor design features were used by previous landowners.

Jackson drainage:

Riparian vegetation within the Jackson Creek watershed is either nonexistent, lacking diversity, or too narrow. Many areas lack sufficient vegetation to provide stream-side shade and protect streambank integrity. The survey notes indicate that a large portion of west fork and the upper east fork of Jackson Creek are downcut and other tributaries are downcut to a lesser degree. The lower stream reaches of Jackson Creek appear relatively stable (e.g., excessive downcutting is not occurring) which may indicate some natural recovery is occurring. Riparian vegetation, such as sedges are becoming established on some streambanks. Some banks are being undercut and sloughing into the creek, widening the channel and building floodplain areas. The tributaries of Jackson Creek have not been inspected.

Whitetail drainage:

The PFC survey notes that Whitetail Creek is severely downcut.

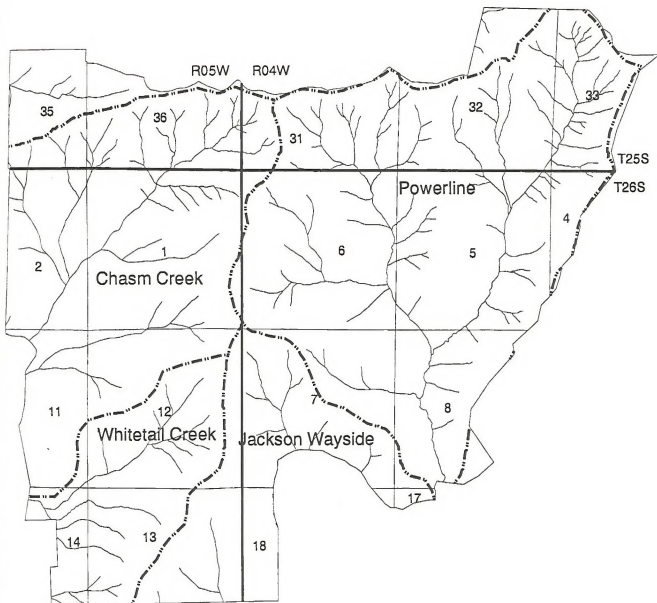
The hydrologic processes in the area are strongly influenced and controlled by the relatively uniform geology – fine-grained, massive bedrock, and clayey soils. According to the WA, "About 90% of the North Bank WAU is occupied with clayey and very clayey soils high in montmorillonite ..." and "... with very slow infiltration and permeability in the wet season." This was confirmed during subsequent field investigations. A majority of the remaining 10% is exposed bedrock. Both units have a high runoff potential and low erosion potential. In areas of deep soils (draws and along valley bottoms) deep-seated, slow mass movement (creep) is frequently encountered.

The streams in the area are intermittent or seasonal, although some water can be found in pools of some streams, indicating influence of ground water from springs or from land flows. The tributary, steep channels are ephemeral channels, in which water flows only in direct response to precipitation. The stream flows are influenced to a large degree by the high runoff potential of the clayey soils and of exposed, low permeability bedrock. Some increase in peak flows could be attributed to vegetation alteration in the area, in particular past harvesting of conifers.

A vegetation map from 1900 (WA - Figure 3-3) shows that less than 20% of the Chasm Creek drainage and 35% of the Jackson Creek drainage were classified as "Woodland". The WA estimates that approximately 45% of the Chasm and Jackson Creek drainages were affected by timber harvest activities by 1963, 36 years ago. Since then, some recovery of the conifer vegetation has occurred. Results from studies of small experimental watersheds suggest that changes in hydrologic processes due to timber harvest and roads result in increased peak flows. However, results are extremely variable, with peak flow increases differing by location, size of the runoff event, amount of disturbance, time of year, type of climatic event and time since disturbance. The effects of roads and cutting on floods are not well defined and difficult to detect. Flows generated from early fall rains are not considered channel forming; lacking the tractive shear forces that affect the fluvial morphology. The higher recurrence interval flows (primarily during the later part of fall and winter, soil moisture differences), depression storage, and interception play a minor role in slowing down the runoff into stream channels. In the case of NBHMA, the other elements of runoff from land (soil moisture groundwater and interflow) are of low consequence, because of the very low infiltration and permeability ranges of the clayey soils and bedrock. These units occupy, as previously mentioned, more than 95% of the watersheds. As a result, the surface runoff is the predominant part of the water routing. Residents of the Umpqua Basin are familiar with the instantaneous water flows, as reflected in flooded back yards and basements.


The fluvial processes that influence stream channel characteristics within North Bank can be better understood utilizing Rosgen stream classification. Rosgen level I and II surveys were conducted along the lower reaches of Jackson Creek (Rosgen, 1996). Stream channels in the NBHMA have been altered from their natural state. The types of stream channels present today are not what would be predicted based on valley type and geology. The first mile of Jackson Creek is either entrenched with a low width/depth ratio and moderate sinuosity (Rosgen type G) or moderately entrenched with a moderate width/depth ratio and moderate sinuosity (Rosgen type B). Based on the valley type, this section of stream should be only slightly entrenched with a moderate to high width/depth ratio and have a high sinuosity (Rosgen type C).

Figure 15 North Bank Habitat Management Area
Drainages



Legend

Scale 1:37000
0.5 0 0.5 1 Miles

 Drainages
 Streams

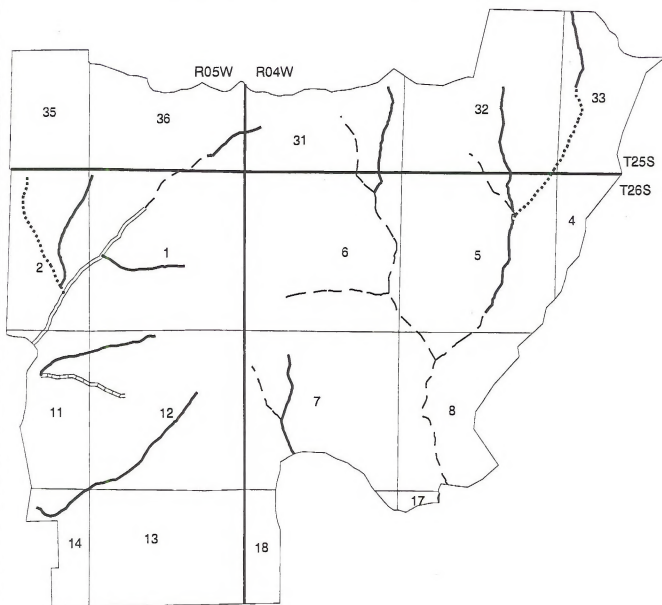
Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



Figure 16

North Bank Habitat Management Area

Riparian Functional Conditions



Legend

- Functioning At Risk - Not Apparent
- Functioning At Risk - Downward
- Functioning At Risk - Upward
- Proper Functioning Condition
- Non-Functional

Scale 1:37000
0.5 0 0.5 1 Miles

Information used for this map was produced using GIS from the North Bank Watershed Analysis



<u>Entrenchment:</u>	is a computed value that depicts the interrelationship of a stream to its valley or geomorphic features. This value determines whether a stream or river is deeply incised or downcut into the valley floor.
<u>Width/depth ratio:</u>	a value indicating the shape of a channel cross section. Values less than 12 have a low width-to-depth ratio and values greater than 12 are moderate or high.
<u>Sinuosity:</u>	A ratio of stream length to valley length or a ratio of valley slope to channel slope. Sinuosity is affected by bedrock controls, roads, soil and vegetation types, confinement, etc. Generally, as gradient and particle size decreases, there is a corresponding increase in sinuosity.

The valleys of Barney Creek, Whitetail Creek, Chasm Creek, and Jackson Creek above the first mile are steeper than lower Jackson Creek valley. The predicted stream channel type of these valleys would be a "B" channel. However, the existing channels are type "G" or are entrenched with a moderate to high width/depth ratio and high sinuosity (Rosgen type F). These streams have downcut until reaching a grade control, typically bedrock or culverts. Observation suggests that the major mechanism causing entrenchment is headward erosion from the main channels.

Channel adjustment from "B" to "G" to "F" and a "C" to "G" is caused by alterations in channel forming processes. Stream channels adjust their dimensions, pattern, and profile to be stable, given the current flow regimes, geomorphology, soil type, gradient and riparian vegetation. A change in one variable, such as width/depth ratio, is likely to cause changes in other channel variables.

Riparian vegetation plays an important role in streambank stability and can minimize effects of increased high flow events on stream bank erosion. However, riparian overstory vegetation is currently lacking throughout much of the ranch resulting in very little large woody debris in streams, increases in stream temperature during the summer, and less summer flow in streams. Large woody debris in streams can increase habitat complexity by forming pools, storing sediment, and creating localized favorable flow conditions.

Winter streamflow has been increased by roads and the removal of vegetation. During moderate and high intensity rainfall, water is channeled down roads or their ditchlines. This water is delivered to the streams faster than if it were subsurface. Also during rainfall events, roots soak up and hold water. The more vegetative biomass the more water can be stored. Conversion of NBHMA land from forest to grassland has decreased the vegetative biomass and the water holding capacity. Restoring summer flows in the NBHMA streams would require replanting riparian and upland areas with woody vegetation.

Vegetation Management & Roads

Past management practices that altered vegetation likely impacted the watershed. Historically the NBHMA was used for cattle production. Unrestrictive grazing may have caused compaction in the upland and riparian areas, reducing the infiltration capacity of the soils. Grazing pressure may have been higher in the riparian areas, particularly during the dry season due to the availability of water. This may have caused bank and vegetation trampling, compaction, removal of streambank and riparian zone vegetation which likely contributed to degraded riparian conditions.

A road inventory within the NBHMA was conducted as a part of this analysis. The length of visible and identifiable roads and trails was measured at 39.2 miles. This translates to a road density of 3.8 miles per sq. mile. Only 1.6 miles of roads, 4% of the total identifiable roads, are surfaced with aggregate, specifically Roads No. 26-4-8.0A and 26-5-11.0. Additional 35.4 miles of primarily skid and fire trails were identified from older aerial photographs. The majority of skid trails are overgrown with vegetation and is therefore "invisible" to the geomorphic and hydrologic processes. The fire access trails run primarily along ridge-tops on bedrock; insignificant environmental effects can be attributed to these landscape features. An inventory of the skid and fire trails was not conducted because they were unidentifiable on the ground (primarily old skid trails), or because no real or potential problems could be associated with them (primarily ridge-top fire trails). A typical road segment is native road surface, that is outslowed and has small cuts and fill slopes. The average number of water diversions was five per mile; the number of dysfunctional drainages was four per mile; the average mass wasting area was 955 square feet per mile; the average length of ruts was 680 feet per mile; and the average number of wet areas was three per mile.

For the WAU which encompasses the NBHMA, road and trail densities, as interpreted from aerial photos, satellite imagery, have at least twice the density of the streams. On the NBHMA, numerous skid trails exist and run along the valley bottoms or in the stream channels. Some bladed trails also go directly up ridge noses on steep slopes. These trails may have been created for fire breaks for timber or pasture management. The compacted surface of the roads/trails and exposed bedrock have contributed to decreased moisture infiltration and higher runoff. Valley bottom and midslope road and trail segments have captured surface and subsurface flows which have contributed to higher velocity runoffs, faster delivery to stream systems via ditchlines, and likely higher peak flows of the affected streams (Wemple, 1994). Analysis indicates, however, that the contribution to peak flows has been minor.

Little is known about timber harvest practices on the ranch (NBHMA). Aerial photographs from 1963 show approximately 45% of both the Jackson Creek and Chasm Creek drainages were logged. Generally clearcuts or partial cuts were conducted (North Bank.WA 1997).

Riparian and Wetland Habitat

Many of the riparian and wetland habitats on the NBHMA lack sufficient vegetation to stabilize, shade, and support healthy riparian communities. Existing vegetation near many of the streams is dominated by grasses and other non-woody vegetation. While they can hold soil in place, shrubs and trees would provide better long-term stability to these areas. Fire suppression and the lack of grazing in recent years have also allowed unnaturally high fuel loadings to accumulate and discouraged the regeneration of riparian woody vegetation. Restoring riparian areas through burning, controlled grazing, and other vegetation management would improve long-term water quality in addition to improving CWT habitat.

Fisheries Species and Habitats

Fish are present in approximately nine miles of stream on the NBHMA. However, most of this habitat is only available in the winter and early spring. Most of the NBHMA is currently not suitable for fish due to low summer flows and elevated summer temperatures. Fish are present in Jackson Creek and its tributaries approximately four miles up from the confluence with the North Umpqua River. The lower mile has the greatest potential for improving fisheries habitat. Coho salmon, steelhead, and cutthroat trout have been documented in Jackson Creek.

Oregon Department of Fish and Wildlife (ODFW) surveys for the Jackson Creek drainage assessed this stream as "poor". The limiting factor was lack of water in the summer months. Fall surveys, in the Jackson drainage, documented few remaining pools, but where there was water, fish were present. Opportunities to enhance fisheries habitat should focus on restoring summer flows in this drainage. Active restoration could include stabilizing stream banks, adding structure to the channel, aggrading the stream bottoms, and revegetating the riparian areas.



Chapter Four

Environmental Consequences

Introduction

An analysis of all alternatives concluded that there would be no effect on: prime or unique farmlands, floodplains, Native American religious concerns, hazardous wastes, wild and scenic rivers, wilderness, wild horse and burro management areas, mineral resources, and existing land uses. These no effect conclusions were reached primarily because these resources were either not present on the NBHMA or because none of the alternatives were relevant to these resources. Of the resources present, the NBHMA has low potential for mineral value (ROD, Purchase EA 1993). Cultural resources are addressed under Actions Common to All Alternatives and would be mitigated by pre-project surveys and the development of a public archaeology program. No adverse effects on the federally listed northern spotted owl, marbled murrelet, and bald eagle are likely. The area is outside of the range of the marbled murrelet and habitat is marginally suitable for use by spotted owls. Bald eagles winter in the area and some suitable nesting habitat is present. Management practices would maintain or enhance conditions desirable to eagles.

This EIS assesses the impacts of the alternatives as they relate to each key issue. A summary of environmental consequences is given for each alternative by key issue. Consequences are first given in a table format to highlight differences between alternatives. A discussion then follows to explain the variation between alternatives. The basis for evaluating the environmental consequences is the affected environment described in Chapter Three. The affected environment is the present condition of the NBHMA, prior to the implementation of any alternative described in this document.

This chapter concludes with a discussion required by the Council on Environmental Quality (CEQ) that an EIS disclose "... any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented" (40 CFR 1502.16).

During the discussion, readers are reminded of mitigation measures taken either as a Common to All Action or through the Project Design Features (PDF) described in Chapter Two. Although the PDF were developed for Alternative C, actions that are similar between the alternatives would be mitigated by the same measures. For example, although the road densities vary between alternatives, they all require maintenance so all would be treated with the same PDF and mitigation measures described in Alternative C.

Issue: Columbian White-tailed Deer and Special Status Species

The primary goal of the NBHMA is to manage habitat for the CWTD and Special Status Plants and animals over time. In addition to the CWTD, there are 34 animal species of special management concern and eleven Special Status Plants on the property (Appendix 2). The NBHMA is also unique in being the largest publicly owned oak habitat in the Umpqua Valley of Oregon's Western Interior Valley Province (Provinces defined in: Puchy and Marshall, 1993). The unique species and features of the NBHMA led to the property being classified as an ACEC. Managing for a diversity of species is complex. Readers should note that management actions to benefit one group of species may create unavoidable impacts to another group of species (e.g. converting an area to a solid forest would result in a loss of grassland species). Species whose habitat needs

are compatible with the primary goal would be benefitted. Species not compatible with CWT D habitat, such as old growth, conifer forest dependent species, may not benefit. A balance is achieved by trying to retain favorable habitat conditions for as many species as possible (species richness), while emphasizing conditions for CWT D and other special status species unique to the NBHMA.

Table 4-1 summarizes the differences by alternative and by management action. As presented in Chapter One, the key indicators for measuring these differences are: CWT D habitat, CWT D disturbance, and Special Status Species Impacts.

CWT D Habitat

Water

Dispersed or alternate water sources, during the hot, dry summer season, may be critical to white-tailed deer survival, especially to lactating females and their fawns. During the summer, evapotranspiration exceeds winter moisture buildups on the NBHMA (Franklin and Dyrness, 1973), thus many water sources become dry. Upland water sources are particularly susceptible to drying. When water sources dry up, animals concentrate closer to remaining water sources. Alternatives A and B retain water availability as it is presently; adequate water during the fall-winter-spring season, but limited during the summer. Management practices to rehabilitate streams to PFC (Properly Functioning Condition) could

Table 4-1. Summary of Consequences for CWT D Habitat

ACTION	Alternative A (No Action)	Alternative B	Alternative C (Proposed)
Impact on CWT D Habitat			
MA11 - Special Status Plants	No Change	Improve	Greater Benefit
MA12- Wetlands and Water Source Development	No Change	Benefit	Greater Benefit
MA13- Grasslands & Oak Savanna	Detriment	Benefit	Greater Benefit
MA 14 - Hardwood / Conifer	Detriment	Benefit	Greater Benefit
MA15- Oak Woodlands	Detriment	Benefit	Greater Benefit
MA16- Other Habitats Rock outcrops, ash wetlands, riparian areas.	No change - rock outcrops	No change - rock outcrops	No change - rock outcrops
	Detriment - wetland and riparian areas	Benefit - wetland and riparian areas	Benefit - wetland and riparian areas
MA17- Timber Management	No Change	No Change	No Change
MA 18 - Vegetation Management	Detriment	Benefit	Benefit
MA19- Forage plots	No Change	Benefit	Benefit
MA20- Wildlife Structures	No Change	Benefit	Benefit

Impact on CWTDD Disturbance			
MA1 through MA19		In all alternatives the disturbance to CWTDD from developments and access will mostly be limited and localized. Disturbances can be controlled by various closures to protect sensitive sites such as fawning, foraging, and bedding areas. Disturbance will be monitored in all alternatives and restrictions imposed as necessary.	
Impacts to Special Status Species			
MA11 - Special Status Plants	No Change	Benefit	Greater Benefit
MA1-10 & MA12-19	In all alternatives most adverse impacts due to development and habitat management for both plant and animal species can be mitigated by pre-action surveys to avoid Special Status Plants sites or critical areas for wildlife. Buffers can be created to protect sites and timing for management actions can be adjusted to avoid critical developmental or reproductive stages. Access can be restricted to avoid sensitive sites or sensitive time periods. Impacts caused by habitat manipulations would vary by species and action. A single action might favor one group of species and create less optimal conditions for another.		

improve the distribution of water on the area. The wildlife water developments in Alternative C would increase the available water in the uplands with a goal of at least one source of perennial water per 320 acres. Water sources would be developed by enhancing current wetland areas to help them hold more water or hold it longer by creating small ponds, collection basins or installing structures such as guzzlers (structures designed to collect and store rainwater). This would distribute water more evenly across the area and provide some sources of water in typically drier upland areas. The increased water is expected to allow deer to use portions of the NBHMA that are currently unsuitable during the summer. Increasing the availability of water could reduce competition between CWTDD by opening more forage areas. Health of individual deer is expected to improve as more forage becomes available and concentration of animals is decreased. Additionally, an increase in water may reduce deer movements across County Road 200 during the summer. Smith (1981) noted that nearly half of the motor vehicle-deer collisions occurred from July through September.

Habitat

Habitat management would enhance forage quality and/or quantity to increase deer survival, physical condition, and reproduction. Alternative A would allow all existing habitats to progress through natural succession. This progression would eventually result in a decrease in grasslands and savanna as the area moved from a grassland-savanna habitat to a shrubland habitat and ultimately a mixed hardwood-conifer forest (Gumtow-Farrior and Gumtow-Farrior, 1992, page 10). Presently, grasslands mixed with oak savanna are believed to be good habitat for CWTDD (Smith, 1981). The progression away from this habitat could be detrimental to the deer. As shrub and conifer encroachment advance, oak savanna and oak woodland would decline. This could reduce individual deer fitness and ultimately reduce the CWTDD population as food resources decrease. Although shrubs provide food and cover for deer, as they become older and more woody, their value to deer decreases. An increase in shrubs and conifers would also increase the area's fuel loads. This could cause a catastrophic loss of habitat in the event of a wildfire. Other habitats such as rock outcrops and riparian areas compose a small

percentage of the area. These habitats would also be allowed to progress naturally. Little change would be expected on rock outcrop due to the low site potential. This alternative makes no provisions to create additional forage areas for deer, or add structures for other wildlife. Ultimately, Alternative A could decrease CWTD habitat, as the habitat progressed to those types that provided less food and reduce the quality of habitat for the deer. This is expected to lower deer fitness, survival, and reproduction.

Alternative B would maintain the current proportion of the area's habitats. Vitality of the habitats would be enhanced by controlling encroachment of undesirable vegetation and competition through active management. Management techniques such as burning, mowing, grazing, and selective cutting would be used to restrict woody encroachment, reduce fuel loads, reduce thatch accumulation, and improve forage quality. These techniques, along with fertilization, noxious weed control, and seeding, would also increase plant vigor and provide more forage or a higher quality of forage and habitat for CWTD. Management activities would be monitored to minimize impacts to CWTD. Shrubs managed in a young, low to mid-height stage would be more readily available for CWTD foraging and provide a higher quality forage than older, larger vegetation. Increasing the vigor of oak savanna and woodlands could potentially increase the number and physical condition of the deer and the carrying capacity of their habitat. Alternative B would reduce conifer invasion of other habitats, keeping the relative proportion of plant communities similar to the present condition. Up to 40 acres of dispersed forage areas could be planted for CWTD, increasing and dispersing food supplies over the landscape.

Currently, research is being conducted on the property to determine what habitats are most important to CWTD. Preliminary results suggest oak woodland, oak savanna, and grassland associated with wetland and riparian areas are the preferred habitat (Smith, 1981 and Whitney personal communication). Since ongoing research projects are not completed yet, **Alternative C** includes habitat management options for all habitat types based on our current understanding of the needs of CWTD. Results of research would be used to adapt management actions. In addition to enhancing current habitat types (see techniques in Alternative B), Alternative C would permit additional land to be converted to habitats found to be most beneficial to CWTD. An increase in favorable habitat could result in an increase in CWTD population. Alternative C would potentially add up to 700 acres of grass-savanna habitat by converting hardwood/conifer vegetation. It would retain the current amount of shrublands (early successional stage of the mixed hardwood/conifer vegetation type) but allow the composition of the shrubs to be converted to those species and age classes found to be most beneficial to CWTD. This would increase the amount of food available for CWTD on the property. Food resources might also be increased if additional oak woodlands or savanna were created. Alternative C would actively manage selected conifer stands (Figure 9) outside of the 400 acres of forest production lands, toward a late successional stage. Management of conifers to a late successional stage would reduce food available in the conifer understory, but it would increase the overall biodiversity of the area and provide thermal cover for deer. Up to 250 acres of dispersed forage areas could be created for deer, increasing the availability of food and potentially helping to disperse the deer. Figure 8 shows potential forage plot areas. Adding artificial structures for other wildlife would have no impact on the deer population.

CWTD Disturbance

Under all alternatives, disturbance to CWTD by facility developments would be unavoidable, but impact would be restricted to those deer with home ranges overlapping the development site. Once development commenced, individual deer would likely shift their activities to portions of their home range away from the development or change their use pattern. This could result in some crowding and displacement of deer off of the NBHMA. After development, the deer would either acclimate to the site and begin to re-use areas near the development, or continue to avoid the area. As long as food and cover resources remain adequate, deer have been able to adapt to structural developments and can be found in rural residential-type areas in addition to wild areas. The Main Barn site, Doc's Landing, and West Entrance (school bus turnaround) have been used previously for access and parking. Enhancing these sites would temporarily cause increased disturbance to the deer.

Unlike County Road 200, roads on the property are not expected to cause mortality to deer because of the low volume of traffic and speeds. Roads however, do affect access to the property for management and research purposes. The road options in Alternatives A and C offer the greatest management access. Alternative B would have the lowest density of roads. Since all maintained roads and trails are open to non-motorized recreation under all alternatives, the level of disturbance caused by human activity on roads/trails would be similar among the alternatives.

The greatest disturbance to CWTD would probably be from human activity. This disturbance is unavoidable as long as the area is open to public use and management activities. However, this disturbance can be mitigated by closing sensitive areas, restricting cross-country travel, and in Alternative C, establishing trails to avoid passage through sensitive areas. Regulations guiding human activity would be implemented as necessary under all alternatives to minimize disturbance to deer. Due to the addition of an interpretive program and watchable wildlife sites, Alternative C provides a greater opportunity to educate people about the needs of CWTD. Alternative C, also prohibits camping next to streams and restricting fire use which would allow deer better access to water, and reduce the chance of wildfire. Overall, Alternative C contains the most provisions to educate the public, re-route travel around sensitive sites, and guide camping activities which may reduce CWTD disturbance. Conversely, the facilities that Alternative C provides may attract more people to the area which could increase the potential for disturbance. By monitoring human use and CWTD disturbance, appropriate limitations on the number of users, types of use, season of use, and location of use could be made to mitigate CWTD disturbance. These mitigation measures should be fairly successful since CWTD have adapted to human activities on other public lands in the area such as Whistler's Bend Park and are found in nearby residential areas.

Special Status Species Impacts

Impacts by Facility Developments and Public Use

Facilities development would result in some impacts on special status animals. Most of the impact would be human, noise intrusion caused by construction, and use of facilities. During facility development, animals may shift their activities away from the site. After development, they may return or remain absent. A percentage of some habitats would be lost once converted to parking or building facilities. Pre-project surveys would identify occupied and critical habitat and recommend mitigation measures. These surveys are part of the PDF recommended for all alternatives. The surveys would be effective in defining Special Status Plants sites and potential habitats. Wildlife may use different areas to meet their food, cover, and reproductive needs. Survey results can be used to

evaluate critical habitat components and whether similar habitat existed that could accommodate potentially impacted species. Proposed developments at the Main Barn site and Doc's Landing are in areas that have already been disturbed and contain some development features. These may have already impacted some species prior to BLM ownership. The development of Doc's Landing may require vegetation be removed which could further impact some species. Developments in Alternatives C and D may improve conditions at these sites by improving drainage of currently used parking areas and installing vault toilets. This could improve conditions by reducing use impacts and improving water quality. Upon final development, approximately 1.5 acres of habitat would be altered at the West Entrance (school bus turnaround) in Alternative C.

Existing roads probably have a negligible impact on Special Status Species, however the roads do impact the BLM's ability to access and manage the NBHMA and non-motorized access for recreationists. Allowing additional trail development in Alternative C would help route users around sensitive sites. Primitive camping and cross-country travel could impact red root yampah, Howell's false caraway, and Hitchcock's blue-eyed grass which grow in meadow and oak savanna habitat. These impacts could be avoided by restricting access to sites where these plants occur. In the five years of BLM ownership, unrestricted primitive camping and cross-country travel has been allowed. No adverse impacts have been noted. Cross-country restrictions would be placed on users if it was determined that areas inhabited by Special Status Species were being degraded or species were being disturbed. Requiring camper registration and imposing spatial and fire regulations, such as in Alternative C, would help campers to avoid sensitive sites and decrease the potential for wildfire. Alternative C would increase public awareness and knowledge of these species through wildlife viewing sites and an environmental education program. Overall, for management actions 1 to 10, Alternative C would provide the most protection for Special Status Species because it imposes more limitations on access, allow trail development to avoid sensitive sites, and better educate the public. As long as the area is open to public use and management, some disturbance to Special Status Species would be unavoidable due to the presence of human activity. Activities and potential disturbance would be monitored in all alternatives to mitigate disturbance by regulating factors such as the number of users, type of use, season of use, and/or location of use.

Management Specific to Special Status Plants (MA12)

At a minimum, all of the alternatives would retain the current populations of Special Status Plants. With the progression of natural succession, Special Status Plants sites in Alternative A would have to be individually maintained to reduce encroachment and competition. Alternative B would enhance the existing populations by improving habitat conditions at selected sites and monitoring these sites to determine if improvements met the objectives. Alternative C would build on Alternative B by trying to establish experimental populations of Special Status Plants at new sites and monitoring the progress of experimental populations. If experimental populations are successful, Alternative C could reduce the vulnerability of some Special Status Plants to local extirpation. Since most of the Special Status Plants either have specialized habitat requirements that form a small portion of the NBHMA, or have already co-existed with deer use, there would probably be negligible impact to CWTD habitat. In all alternatives, areas managed for Special Status Plants would proceed through natural succession once management treatments were halted.

Impacts to Special Status Species by Vegetation Management

Impacts of management actions 11 to 20 vary by alternative and species. To reduce and mitigate impacts, pre-project surveys would be conducted prior to

implementation of management actions for all alternatives. As previously noted, surveys would be most effective to define Special Status Plants sites. Those sites that would be adversely impacted by vegetation management would be avoided.

Vegetation management in Alternative A would allow the entire property to undergo seral progression and provide no additional water, forage, or wildlife structures. Fire suppression and the absence of prescribed fires or similar disturbances like grazing and mowing could cause decreased habitat suitability by competition to Special Status Plants which grow in meadow and oak savanna habitat. These species (red root yampah, Howell's false caraway, and Hitchcock's blue-eyed grass) require frequent, low intensity fires which were common prior to settlement in the western interior valleys of the Cascades (Franklin and Dyrness, 1973; Smith, 1985, BLM 1996). Without a regular management regime, woody encroachment and other vegetative competition could exclude those species. Seral succession would also create favorable conditions for some species and decrease or eliminate other species. As open habitats were replaced by a mixed conifer-hardwood habitat, some species such as certain reptiles, cavity nesters, bats, and grassland/edge species could undergo population declines as habitat specific to their reproductive or foraging needs decreased. Populations of woodland species could increase as the amount of woodland increased. Species such as the red tree vole, which are specific to a conifer habitat, would likely increase in number as conifers replaced oak woodlands. Cumulatively, species richness could decline over time due to seral development and the lack of regular disturbance like fire or grazing. More Special Status Species would have population decreases than population increases. The landscape would become more shrubby and forested. Some species could be excluded from the property until a disturbance event such as fire reverted some habitats back to an earlier seral stage.

Alternative B would maintain and enhance the current habitat types. Vegetation manipulations would be properly planned to avoid impacting Special Status Plants or animals (see Chapter Two PDF). Pre-project clearance surveys, cleaning of equipment prior to treatment, and modifications in the timing, location, or intensity of management actions would reduce or eliminate impacts. Pre-project surveys would also have to be conducted prior to planting forage areas for CWTDD so that Special Status Plants sites would not be disturbed. Under this alternative, habitat for species of concern would be maintained at current levels. The vitality of these habitats would be enhanced, potentially creating more favorable food, cover, and/or habitat conditions for Special Status Species. Overall, Alternative B would maintain species richness in Special Status Species habitats, or increase it in some habitats as plant vigor and food resources were enhanced.

Based on research recommendations, some habitats in Alternative C would be expanded for CWTDD at the expense of other habitats. Conversely, research may find that the current conditions are adequate and a management plan similar to Alternative B would be used to maintain the present habitats. As in Alternative B, pre-project clearance surveys, cleaning of equipment prior to treatment, and modifications in the timing, location, or intensity of management actions would reduce or eliminate impacts to Special Status Species. Although habitat alterations would benefit CWTDD, they would probably not be large enough in scope to exclude other wildlife species and may be beneficial to some species such as the acorn woodpecker and western gray squirrel. In this alternative, wildlife would benefit from having perennial water sources added to the property. Special Status Plants species would benefit from the establishment of experimental populations. The addition of artificial nesting structures would benefit some listed species such as the western bluebird, Vaux's swift, and purple martin in addition to several species of bats. Of the alternatives, the cumulative effects of the vegetative enhancements, retention of a diverse landscape, addition of water, addition of

experimental plant populations, and use of wildlife structures in Alternative C could improve the food, cover, and/or habitat conditions for the highest number of species of special concern on the area. Species richness would be maintained or increased.

Issue: Facility Development and Public Use

The secondary goal of the NBHMA is to accommodate uses that are compatible with the primary goal. Management actions 1 to 10 have direct impacts on facility development and public use. The key indicators for measuring differences between the alternatives are: number of restrictions and amount of facility development. Management actions to manipulate vegetation have little impact on this issue, so are only briefly discussed when appropriate.

Number of Restrictions

Management goals can be achieved through implementing restrictions on public use or facility development. They can control the number of users, types of activities, and areas available for public use. An example would be: the design and layout of parking facilities would influence the number of users an area would receive. Restrictions could be used to reduce disturbance to Special Status Species, avoid degradation of habitat, or decrease safety hazards. Programs like "Leave No Trace" minimize impacts. In general, recreationalists prefer fewer restrictions in relation to time, space, and activities they engage in. Ultimately, a balance should be achieved by providing quality recreation opportunities that is compatible with managing habitat for CWTD and Special Status Species.

For roads, Alternative A is the least restrictive alternative since it would potentially allow all current roads to be maintained for management activities (32 miles). Although some roads are currently unusable, they could be repaired to provide management access. Consequently, this alternative would eventually provide the largest number of miles of maintained road on the area. Although public use is non-motorized, maintained roads would provide favorable riding conditions for mountain bikers, and equestrian users. Cross-country travel would be allowed by all non-motorized users throughout the property unless otherwise posted. Public access in Alternative A is highly restrictive. Currently, users must walk into the area from County Road 200, although special permission can be gained to use a motorized vehicle to drive to the Main Barn site. Users and motorists on County Road 200 face safety hazards since most access pull offs are small and offer little protection from traffic on the county road. Primitive camping is unregulated in Alternative A. No registration is required and no spatial limitations are imposed. This would allow campers to camp anywhere on the property unless otherwise posted.

Alternative B would contain the fewest maintained roads (23 miles), thus would have the highest access restrictions for management activities and the least maintained roads for recreationists. Non-motorized users could still use all roads, and roads not maintained for management access would be converted to trails. All trails would be open to non-motorized travel. Access restrictions would be the same as the previous alternative, as would camping. Access hazards would be decreased some by enhancing the existing pull offs. Overall, this alternative would have the highest access restrictions because of the low amount of maintained roads, cross-country restrictions, lack of linking trails, and walk in only access. It would retain unregulated camping, which may be favorable to campers, but would have the same environmental impacts noted in Alternative A.

Under Alternative C, 32 miles of road would be maintained for management access. This alternative would allow additional trails to be created to link popular areas or to avoid user conflicts and sensitive sites. Access for the public would be increased by allowing day time motorized access to parking areas developed at the Main Barn site, West Entrance, and Doc's Landing. Locking the Main Entrance at night would be an inconvenience to primitive campers who need to leave after dark or before sunrise. However, a host would normally be present at the Main Barn site office/trailer site, so after hour access could be accommodated. If it became necessary to gate and lock the West Entrance at night, it would be very difficult for primitive campers to leave the area after/before hours. Egress in the event of an emergency would be difficult, since no host would be available. This could create a safety hazard for campers. Selected parking pull offs would be enhanced, and enlarged. This would increase access safety and be especially useful for recreationists unloading horses, bikes, or young children. Special motorized access to portions of the area would be available by permission for groups participating in environmental education activities. Campers would be asked to register and adhere to the "Leave No Trace" program. This prohibits campers from camping within 50 feet of streams, but otherwise they could camp throughout the property unless otherwise posted. The use of fire would be restricted under this alternative to reduce fire hazards during the dry season. Camping restrictions would improve sanitation, reduce litter, reduce fire hazards, protect riparian areas, and minimize camp site impacts. Registered camping in self-contained RV units would be allowed at the enlarged gated pull offs. Thus "Leave No Trace" camping restrictions would be somewhat mitigated by the availability of additional camping opportunities. Cumulatively, Alternative C poses a medium amount of user restrictions. It offers management access to most portions of the NBHMA, improves public access and safety, and limits cross-country travel. It provides the opportunity to create new trails, and it regulates camping, but reduces fire hazards and allows additional camping opportunity. The creation of new trails reduces potential habitat degradation and wildlife disturbance by providing trails in areas people might otherwise be tempted to cut cross-country. The camping restrictions improve environmental conditions by improving sanitation, protecting riparian areas, and minimizing camp site impacts.

Facility Development

Facility development can improve public safety, sanitation, and accessibility. The size of the development can also determine the number of people which can use an area. Facilities can disperse users over the area and enhance the user's experience by making it more comfortable and/or by increasing educational opportunities. The experience can also be enhanced by the visual ambience of the area, however, a visual resources inventory has not yet been conducted on the area.

The current conditions would exist in Alternative A. Pull outs would not be enhanced and would be a safety hazard due to their proximity to the county road. The Main Barn site would be reached by a one mile walk, and would have a single portable, chemical toilet, and an information board. The West Entrance would require parking at the gate or school bus turnaround and a quarter-mile walk to reach the chemical toilet. Access to Doc's Landing would continue to be unmanaged, seasonal, and degraded. The present sanitation problems would persist with the lack of bathroom facilities. No wildlife viewing sites would be created and no environmental education program would be developed. There would be no new facilities developed, consequently current safety, sanitation, and access problems would be unresolved. This alternative would also miss the opportunity to enhance the user's experience through providing wildlife viewing sites and education. Cumulatively, this alternative would retain the current safety hazards and lack amenities to improve sanitation, access, or education.

Alternative B would enhance existing pull outs. It would not significantly enlarge them or provide other parking alternatives, but it would provide a slight improvement over current conditions. The user's experience would be enhanced by the availability of some interpretive material. Facility development at the Main Barn site, West Entrance, and Doc's Landing would remain as they are presently and how they were described in Alternative A. Overall, this alternative would have a low amount of facility development and minor safety and educational improvements over Alternative A.

Alternative C would improve pull outs parking and enlarge up to five pull outs parking areas. Parking areas would also be developed at the Main Barn site, West Entrance, and Doc's Landing. These three main recreation sites would also have vault toilets. The Main Barn site would provide a double vault toilet, four picnic sites, a group shelter (approximately 30 x 40 feet), and BBQ pit, in addition to a manure bin. One or two wildlife viewing areas would be created and an environmental education program would be implemented. It would enhance the user's comfort level and provide educational opportunities. Some irreplaceable habitat loss would occur due to the development of facilities. The Main Barn and Doc's Landing sites have been previously used for access and parking. The West Entrance (school bus turnaround) would be enlarged to approximately 1.5 acres. Doc's Landing and the West Entrance developments would be visible and readily accessible from County Road 200. If vandalism or disturbance to wildlife became a problem, these areas could be gated and locked at night.

Issue: Water Quality

Common to all alternatives, erosion and sediment delivery from roads appears to be the most significant source of fine-grained sediment in streams. Numerous researchers found that the amount of sediment production from road prisms depends primarily on proximity to streams, roadbed surfacing, maintenance levels, road traffic, and the condition of cutbanks. Results of a study indicate the relative importance of sediment production from the different categories (Ref.: L. M. Reid, T. Dune - Sediment Production From Forest Roads):

Av. Sediment Yield

Sediment Source	% of Total
Surface of Roads	70.8
- heavy use	9.8
- moderate use	3.8 (light use expected on NBHMA)
- light use	4.5
Cutbanks, ditches of active roads	11.1
Other	

Other studies indicate similar results. The percentages may vary, depending on the erodibility of the cutbanks and of the road surfacing.

The XDS Cross-Drain Spacing Program (USDA Moscow Forestry Sciences Lab) can be used to assess the erosion and sediment delivery from road surfaces for a typical road.. The following parameters were used for the analysis:

Climate:	annual precip. 53"
Soil Type:	clay loam (road surfacing)
Buffer length:	130 ft
Buffer gradient:	10%
Road width:	12 ft (wheel tracks 4 ft)
Rainfall averages:	30 years

The results of this analysis indicates that average annual sediment yield to streams (lb/ft of road length) by road gradient and cross-drain spacing as follows:

Road Gradient	Cross-drain Spacing				
	30 ft	70 ft	130 ft	200 ft	330 ft
2%	0.1	0.2	0.4	0.6	1.0
4%	0.2	0.2	0.7	1.0	2.0
8%	0.3	0.4	1.0	2.0	3.0
16%	0.4	0.7	2.0	3.0	5.0

The previous analysis does not include some important considerations: level of traffic, quality of road aggregate, maintenance level on the road, etc. The analysis does indicate the importance of cross-drain spacing on sediment delivery. Most of the road segments that parallel creeks have gradients of 2% to 4%. The sediment yield from the road surface could be reduced dramatically, if the cross-drain spacing were reduced. For example, the reduction of cross-drain spacing from 330 ft to 200 ft, native road surface with a 4 % grade would reduce the average annual sediment yield from 2.0 lb/ft length to 1.0 lb/ft length, a 50% reduction. Establishing a grass cover would further reduce the sediment yield.

The most effective improvement of the road system is to add cross-drain structures (low water fords, waterbars, culverts, etc). Reducing the flow paths would significantly reduce the erosive power of the collected water, and consequently reduce the amount of sediment transport. Insufficient cross-drains can also lead to road gullyng. Numerous road segments are presently impassable to a 4x4 vehicle. This is due to deep rutting, washed out cross-drains, or slope instabilities (where the roads have failed). The affected road segments are: 25-4-31.1, 26-4-8.0B, 26-4-8.1B, 26-4-8.2, 26-5-11.1A, and 26-5-11.1B. A relatively small amount of fine sediment is being delivered into the streams from the mass wasting sites. The road gullyng can only be reduced by dispersing water (adding drainage structures), and armoring the road surface with rock or grass cover. Road rutting can be prevented by covering the native surfaces with aggregate, grass cover, or blocking vehicle traffic during wet season.

The existing roads in the watershed occupy between 2% and 3% of the area. The clayey soils along the road surfaces have effectively the same infiltration and runoff properties as the uplands - low infiltration and permeability. The roads intercept and divert groundwater flow to a minimal degree. The roads divert surface runoff. With road improvements, there would be a reduction in sediment transport.

The effects of roads on peak flow timing are considered minimal. The natural flow patterns have been altered, as the road inventory indicates (average 4 diversions per mile). The flow alteration resulted in reduction of the flow gradient (roads have generally flatter grades than the tributary stream channels), and the length of the flow has been increased. An engineering analysis indicates that the flow velocities have been reduced by 25% to 50% at the diversion points ("dysfunctional drainages"), effectively reducing the timing of delivery from the tributary channels. In addition, the majority of the road surfaces are vegetated with grass, further reducing the potential for increased runoff.

Most of the major stream crossings show signs of instability and deterioration. Some have failed or are at high risk of failure. If not upgraded, these structures have the potential of delivering substantial amounts of fine sediment into the stream below and jeopardize the road access. An upgrade and hardening of the large stream crossings to

allow them to withstand high flow events would prevent delivery of large amounts of fine sediment into the stream channel below, and would maintain access to the lands beyond the crossing.

Other roads that are substantial distances away from streams and drainages are not likely to deliver measurable amounts of sediment into these streams.

Road improvements will reduce erosion on road surfaces, distribute runoff (rather than concentrating runoff), reduce road gullyng, prevent road gullyng and post holng, and harden stream crossings.

Effects of camping would be similar under all Alternatives. Camping near streams could negatively affect water quality by increasing the potential for pollutants entering streams. Sites used repeatedly may reduce riparian vegetation due to trampling. However, most of the camping occurs at pull outs along the North Bank Road. Excessive use of individual campsites has not been documented. Camping within the interior of the NBHMA is very light and the heaviest use occurs during hunting season. Camping has not posed a problem in the last five years.

Direct, indirect, and cumulative effects of herbicide applications on water quality is not likely as the PDF included in the 1986 and 1987 Noxious Weed Control Program RODs will be implemented on all projects. The likelihood of herbicides contaminating surface water would be highly remote and the contamination of ground water would be unlikely (1987 Northwest Noxious Weed Control Program ROD). Herbicide concentrations would not exceed water quality standards. On NBHMA, herbicide would be applied only to high priority noxious weeds that threaten or reduce CWDTD or Special Status Species habitat. The use of selective herbicides, application to individual weed plants, timing, soil characteristics, and no-spray buffers around water prevent the likelihood of chemicals contacting water and reduces potential damage to non-target species. Only certified applicators would be transporting or using herbicides.

The road miles are highest (32 miles) under Alternatives A and C. Road and trail sediment delivery to streams could be highest compared to Alternative B. Stream network extension due to roads was calculated at approximately eight miles of flow paths above natural conditions. Valley bottom and mid-slope roads most likely contribute additional sediment and flow to streams, while ridge-top roads are of little concern.

Approximately 14 miles of road and trails are within 100 feet of streams, which equates to 20 acres. The 14 miles of roads and trails within 100 feet of streams (Figure 17) are predominately valley bottom roads and represent two percent reduced in potential riparian habitat. A loss in riparian shade and future sources of woody debris, compaction, sediment, and flow delivery to streams and potentially hindering the natural adjustment of streams over time would occur along these roads. The magnitude of impacts to water quality, flow, and channel morphology are presently unknown.

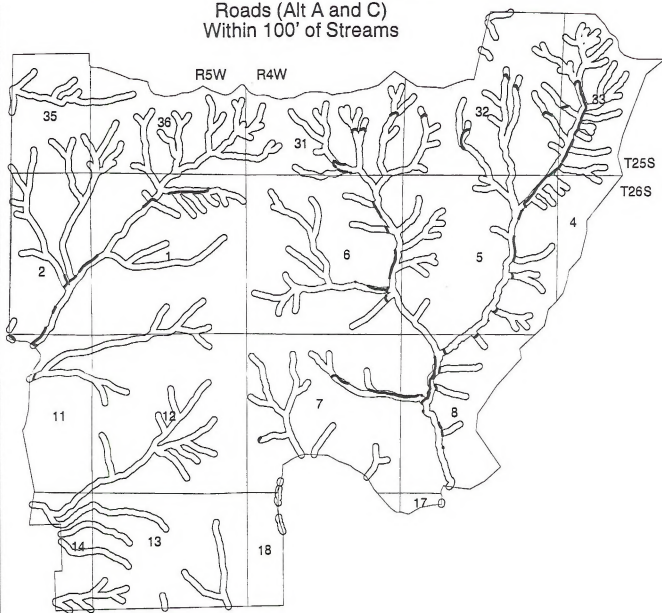
Trails could probably absorb light levels of use, but high use could increase compaction and erosion near streams during the winter months. Impacts are expected to be similar between the Alternatives. However, in the last five years of BLM management, cross-country travel has not posed a problem in terms of erosion and flow paths.

Under Alternatives A, the Main Barn site would be improved to meet building code for public use or would be torn down. No direct impacts beyond current conditions are expected at the Main Barn site and West Entrance. Chemical toilets would be located outside any floodplain and pumped on a regular basis. The amount of impervious surfaces is not likely to change appreciably (above current conditions) and increased runoff is not a likely hydrologic response at these locations.

Figure 17



North Bank Habitat Management Area

Roads (Alt A and C)
Within 100' of Streams



Legend

Scale 1:37000
0.5 0 0.5 1 Miles

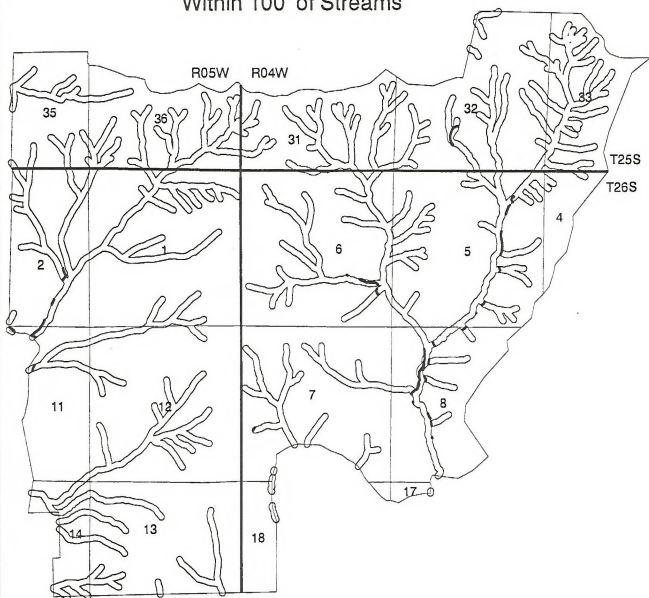
 Roads Within 100' of Streams
 100' Buffer from Streams

Information used for this map was
produced using GIS from the North
Bank Watershed Analysis

Figure 18

North Bank Habitat Management Area

Roads (Alt B)
Within 100' of Streams



Legend



Roads Within 100' of Streams
100' Buffer From Stream

Scale 1:37000

0.5 0 0.5 1 Miles



Information used for this map was
produced using GIS from the North
Bank Watershed Analysis

Vegetation management would allow the area to undergo natural succession. This would increase fuel loads which, if consumed by an intense fire, could result in damage to soil organic matter or soils structure. A large, hot burn would also increase the potential for erosion and sedimentation, especially close to stream channels. Naturally occurring fires on the area have been less than 10 acres (Watershed Analysis 1997) and are most apt to occur during the dry season. Impacts caused by vegetation management would be less than the other alternatives since no manipulative management would be done other than fire suppression and weed control. Timber management would occur under the NFP and appropriate stream buffers would be established. The construction of short spur roads to access timber may increase sediment delivery to streams; however, the use of BMPs (per NFP) and dry season logging should mitigate concerns of sedimentation.

For Alternative A, the vegetation would progress through natural succession. Conifer and hardwoods would increase. An increase in conifers and hardwoods would benefit water resources by armoring streambanks, shading streams, providing a future source of coarse wood, and buffering peak flow responses to storm events. As roads are improved and drainage structures are added to roads and trails, sediment transport would decrease. The number of water sources would remain as they are presently. Overall, water quality would be benefitted.

Alternative B has the fewest miles of roads compared to A and C, and extension of the stream network (due to roads) is lowest under Alternative B. Approximately three miles of road surface flow paths would contribute runoff to streams during winter base flow conditions. Approximately 1.5 miles of valley bottom roads would be retained in this alternative. Blacktail Basin, Soggy Bottoms Way, and upper Chasm Creek roads would be decommissioned or improved for use as trails (see improvements below). Roads not used for management access would become trails. Drainage structures would be added and the surface would be seeded. This would drain the flow of water off the trails, reduce erosion, and stream network extension. Approximately 1.5 miles of road are within 100 feet of streams (Figure 18), which equates to two acres respectively. Road segments within 100 feet of streams are markedly less than Alternatives A and C. Two acres is less than one percent of estimated riparian habitat.

Under Alternative B, the Main Barn site would be improved to meet building code for public use or torn down. No direct impacts beyond current conditions are expected at the Main Barn site and West Entrance. Chemical toilets would be located outside any floodplain and pumped on a regular basis. The amount of impervious surfaces is not likely to change appreciably (above current conditions) and increased runoff is not a likely hydrologic response at these locations.

Active vegetation management would be used to maintain the existing habitat in its current proportions. This alternative could enhance up to 2000 acres of habitat per year through management activities and plant up to 40 acres of forage plots for CWTID. Vegetation management activities could lead to a short-term increase in sediment delivery to streams; however, these impacts could be mitigated by implementing BMPs for contour plowing, seeding, planting, prescribed burns, thinning, and fertilization projects.

Contour plowing and tillage has been successfully done on soils similar to those of the North Bank Habitat Management Area on slopes not exceeding 15 percent with small water quality impact according to the local Oregon State University Extension Service (McCoy, personal communications). Contour plowing is effective erosion control under normal rainfall distributions and intensities. It provides little protection against the intense long return interval storm ([USDA Agriculture Handbook 537](#), 1978). The greatest damage would be incurred under fallow conditions by infrequent intense thunderstorms during the dry season and by early high intensity wet season storms. Mulching would be beneficial in reducing erosion under these conditions.

Generally, prescribed burns on rangelands in western Oregon have not caused excessive erosion due to successful early green up (John Buckhouse of the OSU Range Department, personal communication). The greatest risk of erosion, as a result of fire, would occur in the event of early intense storms before adequate green up (Buckhouse, 1999). Limiting the size of individual burns, careful timing of the burns, and subsequent seedings would mitigate losses. Where perennial grasses are dominant, dense surface root masses and the soil structure give good binding protection for the soil. Slopes dominated by perennial grasses, quick low intensity burns would result in low levels of erosion. Impacts could increase on slopes dominated by shallow rooted annual vegetation and with more intense burns. Grass fires may be intense but they are fast moving, are of short duration, and do not usually kill the roots of perennials. Light fuel loads result in little penetration of heat into the soil. In a high percentage of cases, the burns would not be expected to carry through riparian areas. As a result, there would normally be unburnt stream buffers to filter sediment from above. The adequacy of the buffer would be considered when planning individual burns. Precautions would be taken that fires do not carry onto active headcuts and unstable stream banks.

Prescribed burns, like all vegetation treatments, would be monitored. Additional treatments would be conducted only after project surveys and interdisciplinary review. As perennials become more established, vulnerability to intense storm events would decrease with subsequent burns because of their superior soil binding capabilities.

Fertilization would only occur in Alternatives B and C. Effects would be similar in both Alternatives. Phosphorous and potash added in fertilizer would move very little in the soil; however, nitrogen may be highly mobile in certain forms (nitrates in particular) (McCoy, personal communication, 1997). Very high application rates of urea would have to be applied on local grasslands for appreciable amounts of nitrogen to percolate below the root zones or to volatilize to the atmosphere (McCoy, personal communication, 1997). Careful application of nitrogen fertilizer would likely not result in measurable nitrogen levels of waters or wetlands downstream (McCoy, personal communication, 1997). No-fertilization stream buffers of 25 feet for broadcast application and 100 feet for aerial application would be sufficient to protect water quality.

The proposed road improvements would result only in minor, not measurable, changes in peak flows and timing. Reducing water movement along roads would reduce the amount of gullying, rutting, and associated erosion. Sediment transport would decline. Streambank stability would increase. As woody vegetation along streams increase, stream shading would increase.

In Alternative C, road and trail effects would be the same as Alternative A. Vegetation management methods used in Alternative B would have the similar impacts in this alternative. About 2,000 acres could be actively managed each year and forage plantings could increase to 200 acres. Water quality and quantity impacts from manipulating vegetation would be the same as Alternative B, and specific projects would be reviewed before implementation. This alternative would allow grazing as a tool to manage vegetation.

Grazing can alter riparian/wetland habitat in four major ways: alteration of stream side soils and vegetation, channel morphology, water column, and streambanks. These potential affects would be mitigated by: timing of grazing, type of livestock, supplemental water and salting, and exclusion from sensitive areas. Grazing would be timed to have the least impact on desirable species or the most impact on undesirable species and to reduce the desirability of riparian areas. For example, in winter, stream channels tend to funnel cold air, making them unattractive to livestock. Yearling to adult cattle would be used as they would use the uplands more, and have much less impact on riparian areas. Supplemental water and salt would be used to move grazers away

from streams, springs, and wetlands. Permanent and temporary fences would also be employed to exclude livestock from vulnerable stream sides, natural springs, fragile soils, and special habitats.

Under Alternative C, construction and improvement of facilities may increase the amount of impervious surface in riparian areas. This may increase the amount of runoff entering stream channels during winter storms, but is likely to be within the range of natural variability of flows in North Bank streams. Controlling sediment delivery during construction/improvement activities and planting riparian vegetation around these areas would minimize concerns of increased peak flows. Facility development at the Main Barn site would continue the irretrievable loss of vegetation and soils currently present at the site. Developments at the West Entrance would be expanded and cause irretrievable loss of vegetation and soils on approximately 1.5 acres of land and may increase runoff from the parking lot. Doc's Landing would improve an undeveloped area, used by the public as a boat ramp, into a developed boat ramp. This would result in an irretrievable loss of vegetation and soil that would be covered by a surfaced parking lot and boat ramp. Construction of Doc's Landing would create a short-term pulse of sediment into the North Umpqua River. Long-term benefits would result from replacing a dirt ramp with a surfaced ramp and providing year-round water access for the rural fire department.

Stream rehabilitation would be implemented under this Alternative. The strategy for stream rehabilitation is to: preserve the best habitat, improve the stream segments that are slightly degraded, stabilize degraded stream segments, and aggrade stream channels.

Jackson Creek was identified as being the highest priority for rehabilitation. An intensive inventory of three stream channel forks in the upper Jackson Creek was conducted. The primary goal of the stream inventory and subsequent analysis was to identify stream segments that are at the highest risk of future degradation. The secondary goal of the inventory was to locate areas where rehabilitation or upgrade of partially degraded stream channels would be most beneficial. That is, the order of priority is to: protect the best riparian; rehabilitate the riparian at-risk with upward trend; rehabilitate riparian at-risk with downward trend; rehabilitate nonfunctional riparian.

Issue: Riparian and Wetland Habitat

Under Alternatives A and B, no active stream rehabilitation would be done. Passive rehabilitation would occur - trees and shrubs would grow along streams, shade would increase and water temperature would decrease. Wetland resources would be largely unchanged. Wetlands would benefit where "soft spots" in roads, that occur in wetlands, would be replaced with a rock blanket. The rock blanket hardens the road surface and also allows water to drain through the subgrade. Additional cross-drains in roads would also benefit wetland and riparian resources.

Stream rehabilitation would be implemented under Alternative C. The strategy for stream rehabilitation is to: preserve the best habitat, improve the stream segments that are slightly degraded, stabilize degraded stream segments, and aggrade stream channels. Jackson Creek was identified as being the highest priority for rehabilitation. An intensive inventory of three stream-channel forks in the upper Jackson Creek was conducted. The primary goal of the stream inventory and subsequent analysis was to identify stream segments that are at the highest risk of future degradation. The secondary goal of the inventory was to locate areas where rehabilitation or upgrade of partially degraded stream channel would be most beneficial. That is, the order of

priority is to: protect the best riparian; rehabilitate the riparian at-risk with upward trend; rehabilitate riparian at-risk with downward trend; rehabilitate nonfunctional riparian.

A combination of active and passive stream rehabilitation would improve riparian and aquatic habitat. Some stream reaches are relatively stable and in a more "advanced" state of recovery, such that passive rehabilitation is preferable. Active rehabilitation may involve the use of heavy equipment (depending on scope of the project) to accomplish a wide range of techniques: such as re-routing short (~50 feet) sections of streams, pulling back stream banks for desirable angle of repose and planting areas, adding structure to streams, stabilizing stream banks, and planting riparian vegetation. Examples of passive rehabilitation are: growth of woody vegetation, streambank sloughing, and stream widening.

Stream rehabilitation would occur on a project-by-project basis and may cause sediment to be mobilized downstream. Most projects would occur during the dry summer months when suspended sediment and turbidity levels are naturally low. The projects are of short duration and sediment pulses to streams are not expected to adversely effect current habitat or downstream beneficial uses. Conversely, long-term benefits of stream rehabilitation would outweigh short-term impacts due to sediment production (Rosgen, 1999 personal communication). Stream bank erosion following rehabilitation activities should drastically decrease sediment production compared to current levels. Expected results of stream rehabilitation are: stream bank stabilization, increased woody species along streams, increased stream shading, trapping sediment, reversal of down cutting (aggradation) of stream channels, improved water quality, higher water tables, and improved fisheries habitat.

The upper, eastern portion of the stream would be the priority targeted for rehabilitation. The middle portion of the stream, where substantial degradation of the channel is evident, would be considered for rehabilitation later. The lower portions of Jackson Creek and the west branch have improving conditions. Only minor, site specific stream rehabilitation will be proposed there. Stabilizing the headcuts would undoubtedly reduce the risk of further stream degradation in the upper Jackson Creek. This action would protect the vital stream-side vegetation. The proposed stream rehabilitation would stabilize the stream banks, as well as provide shade in this stream segment.

Rehabilitation of the tributaries of the North Umpqua River would have positive effects on the water quality and fisheries habitat in the river. Specifically, a reduction of fine sediment delivery and decreased stream temperatures.

There would be short-term impacts to water resources in terms of road and trail improvements, construction of water sources, and stream rehabilitation projects. There is potential for impacts from vegetation management in terms of sediment, fertilizer, or herbicides affecting water quality. However, with the implementation of project design features, the risk is considered low. The proposed road improvements would result only in minor, (not measurable) changes in peak flows and timing. The elimination of water diversions would reduce the amount of gullyng and associated erosion below the diversion points. Sediment transport would decline. Streambank stability would increase. As woody vegetation along streams increase, stream shading would increase. Water quality would increase as sediment transport declines and as water temperature declines.

Wetland resources would be largely unchanged. Selected wetlands would be developed to provide water sources for wildlife, horses, and livestock. Examples of water developments include: small ponds, pot holes, and dug-outs. Impacts to wetlands would be similar to those that occurred when the NBHMA was a working ranch.

Impacts would be less due to the greater restriction applied to grazing under BLM management compared to private ownership. Wetlands would benefit where "soft spots" in roads, that occur in wetlands, would be replaced with a rock blanket. The rock blanket hardens the road surface and also allows water to drain through the subgrade. Additional cross-drains in roads would also benefit wetland and riparian resources.

Effects to Fisheries Species and Habitat

There are approximately nine miles of stream within the NBHMA that support fisheries species during part of the year. Most of these stream reaches lack flowing water during the spring, summer, and early fall. Most of the streams are slowly recovering since the acquisition of the NBHMA. However, some key stream segments are continuing to degrade and others are at risk of continued erosion.

For Alternatives A, B, and C, rehabilitation efforts would stabilize stream banks, increase summer water, and speed recovery of these systems over time. When implemented, active rehabilitation activities would move toward improving fish populations and habitat.

Cumulative Impacts

Table 4-2. Cumulative Impacts from all alternatives.

Action	Alternative A (No Action)	Alternative B	Alternative C (Proposed Action)
CWTD Management	Detriment	Benefit	Greater Benefit
Special Status Plants	No Change	Benefit	Greater Benefit
Special Status Animals	Detriment	Benefit	Greater Benefit
Recreation Use and Facilities Development	No Change	Benefit	Greater Benefit
Water Quality and Quantity	Benefit	Benefit	Greater Benefit
Riparian and Wetland Habitat	No Change	Benefit	Greater Benefit

Additional Considerations

Cultural Resources

The potential for adverse impacts on currently unidentified cultural resources varies with the amount of surface disturbing activity permitted under each alternative. Proposed activities that could contribute to adverse impacts include road maintenance, trail development, recreation facility developments, vegetation conversions, and wildlife water developments. Alternatives with little or no ground disturbance such as Alternatives A and B would have a low potential for impacting cultural resources. Alternative C would have a moderate potential and Alternative D would have the highest potential for impacts. Affirmative measures common to all alternatives such as inventory, evaluation, interpretation, and education will have some positive impacts. Some adverse impacts would occur regardless of which alternative is selected due in large part to natural deterioration and erosion.

Air Quality

Prescribed fire would have a temporary impact to air quality. Smoke, from fire, would impact air quality up to 24 hours. All prescribed burns would comply with the requirements of the Clean Air Act and the Oregon Smoke Management Plan.

Unavoidable Adverse Effects

Potential adverse effects which could not be avoided if the various alternatives were implemented have been presented earlier in this chapter.

Relationship of Short-Term Uses and Long-Term Productivity

Short-term for the sake of this plan is considered to be one year or less and long-term is greater than one year. The implementation of Alternatives B and C would result in a possible short-term decline in water quality due to instream and riparian enhancement projects. This short-term loss is expected to be minor given the use of sediment limiting Best Management Practices. Additionally, such projects are in-stream reaches that are intermittent and would be accomplished during the summer dry season when the streams are dried up. Such decreases would be confined to localized sediment input into streams during implementation or as a first season sediment flush following fall rains. The condition and productivity of the riparian system would be greatly enhanced in the long-term.

Irreversible and Irretrievable Commitments of Resources

An irreversible commitment is a commitment that cannot be reversed. Mining is an example of an irreversible commitment of resources. Once ore is removed it cannot be replaced. An irretrievable commitment is a commitment that is lost for a period of time. The construction of a parking lot is an example of an irretrievable commitment of resources. The vegetation and soil resources at a particular location would be irretrievably lost during the time period that a parking lot existed. A parking lot could be decommissioned and returned to the productive landbase. An irreversible commitment of crushed rock for road surfacing and petrochemicals for management activities would occur under all Alternatives. Rock sources on the NBHMA could be developed as a source of rock for road repairs and in-stream structures. The existing rock sources are of low grade; therefore, crushed rock would be obtained from commercial sources. An irretrievable commitment of resources of land converted to parking lots and riparian areas converted to standing water would occur under several of the Alternatives.

Chapter Five

List of Preparers

Introduction

This chapter presents a list of individuals that contributed to this EA and Management Plan. These people served on the ID Team that developed the Alternatives. Later, individuals formed teams to address the four key issues identified in previous chapters and to prepare reports on the environmental consequences of each Alternative. The ID Team was a multi-agency group composed of BLM personnel and personnel from other agencies.

Name	Contribution(s)	Degree(s)/ Years of Experience
<i>Bureau of Land Management</i>		
Isaac Barner	Archaeologist	B.A. Anthropology 25
Karel Broda	Geotechnical Engineer	M.S. Geotechnical/Environmental Engineer 22
Kevin Cleary	Fires/Fuels	B.S. Forestry 5
Ralph Klein	Project Lead/ID Team Facilitator	B.S. Wildlife Sci. 21
Dan Cressy	Soils	B.S. Soils 21
Russ Holmes	Botany & Special Status Species	B.S. Biology/ M.S. Biology 20
Jim Luse	NEPA Coordinator	B.S. Forestry 24
Al James	Silviculture	B.S. Forestry 21
Jeanne Klein	Botany & Noxious Weeds	B.S. Rangeland Res 6
Jerry Mires	Wildlife	B.S. Wildlife Sci. 24
Gregg Morgan	Recreation	B.S. Recreation 20
Jim Ramakka	Biologist	B.S. Wildlife Sci./ M.S. Wildlife Mgmt. 27
Ed Rumbold	Hydrology	B.S. Natural Res Mgmt 14
Garth Ross	Fisheries	B.S. Wildlife 11
<i>United States Fish & Wildlife Service</i>		
Dave Peterson	Wildlife & Special Status Species	B.S. Zoology/ M.S. Wildlife Sci. 23
<i>Oregon Department of Fish & Wildlife</i>		
Mike Black	Wildlife & Special Status Species	B.A. Biology/ M.A. Zoology 27

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GLOSSARY

ACEC - Area of Critical Concern - An area of BLM-administered lands where special management attention is needed to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes; or to protect life provide safety from natural hazards (RMP, p. 101).

Aggrade - To fill and raise the level of a streambed by deposition of sediment.

Alluvial - Originated through the transport by and deposition from running water (FEMAT, p. IX-2).

Aquatic ecosystem - Any body of water, such as a stream, lake or estuary, and all organisms and nonliving components within it, functioning as a natural system (FEMAT, p. IX-2).

Aquatic habitat - Habitat that occurs in free water (FEMAT, p. IX-2).

Beneficial Use - In water use law, reasonable use of water for a purpose consistent with the laws and best interests of the people of the state. Such uses include, but are not limited to, the following: instream, out of stream, and ground water uses, domestic, municipal, industrial water supply, mining, irrigation, livestock watering, fish and aquatic life, wildlife, fishing, water contact recreation, aesthetics and scenic attraction, hydropower, and commercial navigation (FEMAT, p. IX-3).

Bioaccumulation - Accumulation of substances within a living organism.

Biodegradation - Decomposition by natural biological processes.

BMP - Best Management Practices - Methods, measures, or practices designed to prevent or reduce water pollution. Not limited to structural and nonstructural controls, and procedures for operations and maintenance. Usually, Best Management Practices are applied as a system of practices rather than a single practice (RMP, p. 102).

Carrying Capacity - The maximum number of organisms that can be supported in a given area of habitat at a given time (FEMAT, p. IX-5).

Conifer - A tree belonging to the order Gymnospermae, comprising a wide range of trees that are mostly evergreens. Conifers bear cones (hence, coniferous) and needle-shaped or scalelike leaves (FEMAT, p. IX-7).

Cumulative Effects - Those effects on the environment that result from the incremental effect of the action when added to the past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (FEMAT, p. IX-8).

DBH - Diameter at Breast Height - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree (RMP, p. 104).

Decommission - To remove those elements of a road that reroute hillslope drainage and present slope stability hazards. Another term for this is "hydrologic obliteration" (FEMAT, p. IX-8).

Down Cutting - A general term that describes the relationship of a stream to its valley and landform features. It is quantitatively defined as the vertical containment of a stream and to the degree it is incised in the valley floor.

Extirpation - The local extermination of a species.

Grassland - Habitat composed primarily of grasses and forbs. These areas may contain scattered trees and/or shrubs.

Guzzler - A structure designed to capture and store rainwater for use by animals. Usually consists of a catchment apron, holding tank and water trough or fountain. Does not rely on stream or spring systems to fill with water.

Headcuts / headcutting - Hydrology and soils term - The process by which erosion moves up a stream channel towards the headwaters, usually creating deep gullies in the lower portions of the stream below the area of active erosion.

Hydrologic Group - The description of the runoff potential of an area based on the natural physical properties of soil and bedrock, but does not consider slope. Generally high runoff potential may describe an area of low permeability, such that water reaches stream channels faster than areas with low-moderate runoff potential.

Integrated Pest Management - Use of combined methods to control noxious pests or weeds. In this document it refers to the combined use of biological controls (insects, pathogens), manual labor (hand pulling, cutting), mechanical methods (mowing, tilling, scraping, etc.) and /or use of herbicides. In certain instances, combinations of these methods may be required to eliminate or control infestations.

Moderately well drained - Soil drainage class where water is removed from the soil somewhat slowly, so that the profile is wet for a small but significant part of the time. Moderately well drained soils commonly have a slowly permeable layer within or immediately beneath the A and B horizons, a relatively high water table, additions of water through seepage, or some combination of these conditions (Soil Survey Manual, 1951, p.171).

Leave No Trace Camping - A program which teaches and develops practical conservation techniques based on six principles (plan ahead and prepare; travel and camp on durable surfaces; pack it in, pack it out; properly dispose of what you can't pack out; leave what you find; and minimize use and impact of fire), and is designed to minimize impacts of visitors on the back country environment.

Noxious Weed - A plant specified by law as being especially undesirable, troublesome, and difficult to control (RMP, p. 108).

Oak Savannas - Grasslands containing scattered oak trees. Typically, canopy closure of oaks ranges up to 30%.

Oak Woodlands - Wooded area in which the dominant tree species are oak and the canopy closure 30% or greater.

PFC - Properly Functioning Condition - Riparian - Wetlands are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature

necessary for fish production, waterfowl breeding, and other uses; and support of biodiversity (BLM TR 1737-9, 1993)

Poorly drained - Water is removed so slowly that the soil remains wet for a large part of the time. A water table is commonly at or near the surface for a considerable part of time. Poorly drained conditions are due to a high water table, to a slowly permeable layer within the profile, to seepage, or to some combination of these conditions. Wetlands are commonly associated with poorly drained soils (Soil Survey Manual, 1951, p. 170).

Riparian areas - Locations that maintain vegetation that is influenced by saturated soil conditions. These areas may be found along stream and pond margins and in springs, seeps, bogs and wetlands.

Riparian zone - That area of vegetation that exists between aquatic habitats and dry, well drained, upland habitats. The zone is indicated by the presence of riparian vegetation such as sedges, rushes, and other vegetation requiring saturated soil. The area may also be a designated zone that begins at an aquatic habitat type and extends a certain designated distance upland from habitat such as a stream, pond, or wetland.

Road - A vehicle route (permanent road) generally over 50 inches wide which has been improved and maintained to ensure relatively regular and continuous use. This could include rock or grass covered roads. Mainly used for vehicle traffic, recreation trails and fire control.

Sensitive areas - Locations that are determined to be important to individual species at some time in their life history and that may be damaged by noncompatible uses or areas of fragile habitat types. Examples may be a rare plant location that could be damaged through management or recreational activities or areas such as fawning locations that are important for CWTB and sensitive to disturbance. Habitat types that may be listed as sensitive due to the potential for adverse impacts include riparian areas, rock outcrops, and wet meadows.

Sensitive species - These are species of plants or animals that are listed by the State of Oregon or federal government because of such things as rareness, have threats to their continued existence, may be listed as Threatened or Endangered, may occur only in specialized habitats, or are designated by a government agency as a species of concern. List of sensitive species contained in this document have been derived from both state and federal sources.

Soil Structure - The combination or arrangement of primary soil particles (sands, silts and clays) into secondary particles or units. The secondary units are characterized and classified on the basis of size, shape, and the degree of distinctiveness (Brady, 1990, p. 595). In granular structure, individual grains are grouped into spherical aggregates with indistinct sides. A well granulated soil generally has the most desirable structure for plant growth. Granular structure most often occurs in the surface soil. In blocky structure, soil particles combine into units with block-like shapes. Blocky structure is common in the subsoil.

Soil texture - The relative proportions of sand, silt and clay in a soil (Brady, 1990, p. 595). A clay texture has greater than 40 percent clay. A soil with a clay texture is called clayey when it has 40 to 60 percent clay and very clayey when it has greater than 60 percent clay. A typical silty clay loam texture has 35 percent clay, 55 percent silt, and 10 percent sand. A typical silt loam texture has 15 percent clay, 65 percent silt and 20 percent sand.

Special Attention Plants - Plant species falling in any of the following categories:

- Survey and Manage Species
- Protection Buffer Species (RMP, p. 40)

Special Status Plants - Plant species falling in any of the following categories:

- Threatened or Endangered Species
- Proposed Threatened or Endangered Species
- Candidate Species
- State Listed Species
- Bureau Sensitive Species
- Bureau Assessment Species (FEMAT, p. IX-33)

Take - Under the Endangered Species Act, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect an animal, or to attempt to engage in any such conduct (FEMAT, p. IX-36).

Thatch - A mat of dead vegetation that covers the ground. Specific to NBHMA, thatch is usually composed of dead stalks of non-native grasses or other vegetation that have formed a mat which restricts the growth of other forms of vegetation.

Trail - A route used primarily by hikers, horseback riders, or mountain bikers. These routes may be roads (existing non-permanent roads, jeep trails) converted to trail use (generally over 50 inches wide) or conventional trails (generally less than 50 inches wide). The surface may be natural or rock.

Well drained - Soil drainage class where water is removed from the soil readily but not rapidly. Well drained soils commonly retain optimum amounts of moisture after rains for plant growth. Water tables do not build up within 40 inches of the surface (Soil Survey Manual, 1951, p. 171).

Xeric moisture regime - The yearly soil moisture levels and distributions in a typical Mediterranean climate where winters are moist and cool and summers are warm and dry. One of the requirements is that the soil is dry in all parts of the moisture control section (this is at 10 to 40 inches of depth in the deeper soils) for 45 or more consecutive days in the four months following the summer solstice (Keys to Soil Taxonomy, 1992, p. 37).

Appendix 1

ANIMAL SPECIES OF MANAGEMENT CONCERN

1. **SPECIES AT RISK:** Sensitive, Threatened and Endangered Vertebrates of Oregon (Oregon Department of Fish and Wildlife, Wildlife Diversity Program, June 1996).

Clouded Salamander	<i>Aneides ferreus</i>
Common Kingsnake	<i>Lampropeltus getulus</i>
Foothill Yellow-legged Frog	<i>Rana boylei</i>
Red legged Frog	<i>Rana aurora</i>
Sharptail Snake	<i>Contia tenuis</i>
Western Pond Turtle	<i>Clemmys marmorata</i>
Acorn Woodpecker	<i>Melanerpes formicivorus</i>
Northern Pygmy Owl	<i>Glaucidium gnoma</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Purple Martin	<i>Progne subis</i>
Western Bluebird	<i>Sialia mexicana</i>
Vesper Sparrow	<i>Pooecetes gramineus affinis</i>
Fringed Myotis	<i>Myotis thysanodes</i>
Yuma Myotis	<i>Myotis yumanensis</i>
Long-eared Myotis	<i>Myotis evotis</i>
Long-legged Myotis	<i>Myotis volans</i>
Fringed Myotis	<i>Myotis thysanodes</i>
Silver Haired Bat	<i>Lasiorycteris noctivagans</i>
Pallid Bat	<i>Antrozous pallidus</i>
Townsend's Big-eared Bat	<i>Plecotus townsendii</i>
Ringtail	<i>Bassariscus astutus</i>
Western Gray Squirrel	<i>Sciurus griseus</i>

2. MIGRATORY NONGAME BIRDS OF MANAGEMENT CONCERN IN THE UNITED STATES:

(USFWS, September 1995).

Vaux's Swift	<i>Chaetura vauxi</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Red-Breasted Sapsucker	<i>Sphyrapicus ruber</i>
Olive-Sided Flycatcher	<i>Contopus sordidulus</i>
Pacific Slope Flycatcher	<i>Empidonax difficilis</i>
Peregrine Falcon	<i>Falco peregrinus</i>
Hermit Warbler	<i>Dendroica occidentalis</i>

3. **ENDANGERED and THREATENED WILDLIFE and PLANTS:** Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species (50 CFR Part 17, Federal Register Notice, Wednesday, February 28, 1996).

No species found on the NBHMA are listed as candidates as of this date.

4. SEIS SPECIAL ATTENTION SPECIES: (Roseburg BLM RMP, Appendix H, June 1995).

Red Tree Vole *Phenacomys longicaudis*

5. BLM ASSESSMENT SPECIES: Roseburg District, Bureau of Land Management. (Compiled 1991, R.J. Wilk).

Clouded Salamander.....	<i>Aneides ferreus</i>
Northern Red-legged frog.....	<i>Rana aurora</i>
Foothill Yellow-legged frog.....	<i>Rana boylei</i>
Northwestern Pond Turtle.....	<i>Clemmys marmorata</i>
Sharptail snake.....	<i>Contia tenuis</i>
Common Kingsnake.....	<i>Lampropeltis getulus</i>
Mountain Quail.....	<i>Oreortyx picta</i>
Pileated Woodpecker.....	<i>Dryocopus pileatus</i>
Purple Martin.....	<i>Progne subis</i>
Western Bluebird.....	<i>Sialia mexicana</i>
Western Meadowlark.....	<i>Sturnella neglecta</i>
Yuma Myotis.....	<i>Myotis yumanensis</i>
Long-eared Myotis.....	<i>Myotis evotis</i>
Long-legged Myotis.....	<i>Myotis volans</i>
Fringed Myotis.....	<i>Myotis thysanodes</i>
Big-eared bat.....	<i>Plecotus townsendii</i>
Pallid bat.....	<i>Antrozous pallidus</i>

6. RARE, THREATENED AND ENDANGERED ANIMALS OF OREGON:

Oregon Natural Heritage Program, December 1995

SPECIES	NATURE CONSERVANCY RANKING	FEDERAL STATUS	STATE STATUS
Umpqua Cutthroat trout	Rare, uncommon or threatened, not imperiled	proposed Endangered	Vulnerable
Coho Salmon Rare, uncommon or threatened, not	imperiled	proposed Threatened	Critical
Clouded Salamander	Not rare, long term concern		undetermined status
Northern Red-Legged frog	Not rare, long term concern	Species of Concern	Vulnerable
Foothill yellow-legged frog	Rare, uncommon or threatened, not imperiled	Species of Concern	Vulnerable
Northwestern Pond Turtle	Imperiled	Species of Concern	Critical
Sharptail snake	Not rare, long term concern		Vulnerable
Common Kingsnake	Imperiled due to rarity		Vulnerable
Pileated Woodpecker	Not rare, long term concern		Vulnerable
Northern Pygmy Owl	Not rare, long term concern		undetermined
Bald Eagle	Rare, uncommon or threatened, not imperiled	Threatened	Threatened
Acorn Woodpecker	Rare, uncommon or threatened, not imperiled		
Purple Martin	Rare, uncommon or threatened, not imperiled		Critical
Western Bluebird	Not rare and apparently secure		Vulnerable

SPECIES	NATURE CONSERVANCY RANKING	FEDERAL STATUS	STATE STATUS
Pallid Bat	Rare, uncommon or threatened, not imperiled		Vulnerable
Ringtail	Rare, uncommon or threatened, not imperiled		undetermined
Silver-haired Bat	Not rare and apparently secure		undetermined
Long-eared Bat	Rare, uncommon or threatend, not imperiled	Species of Concern	Vulnerable
Fringed Bat	Rare, uncommon or threatened, not imperiled	Species of Concern	Vulnerable
Long-legged Bat	Rare, uncommon or threatened, not imperiled	Species of Concern	undetermined
Yuma Bat	Rare, uncommon or threatened, not imperiled	Species of Concern	undetermined
Columbian White- tailed deer	Imperiled because of rarity	Endangered	Vulnerable
Pacific Western Big- Eared bat	Rare, uncommon or threatened, not imperiled	Species of Concern	Critical
Western Gray Squirrel	Not rare and apparently secure, long term concern		undetermined

HABITAT GROUPS OF SPECIES OF SPECIAL CONCERN ON THE NBHMA

Group 1, Aquatic Amphibians and Reptiles

- Foothill Yellow-legged frog
- Red-legged frog
- Western Pond Turtle

Group 2, Cavity Dwellers

- Clouded salamander
- Acorn Woodpecker
- Northern Pygmy Owl
- Pileated Woodpecker
- Purple Martin
- Western Bluebird
- Red tree Vole
- Vaux's Swift

Group 3, Bats

- Fringed Myotis
- Yuma Myotis
- Long-Eared Myotis
- Long-legged Myotis
- Fringed Myotis
- Silver Haired Bat
- Pallid Bat
- Townsend's Big-eared Bat

Group 4, Open Habitat/Edge Species

- Common Kingsnake
- Western Pond Turtle
- Purple Martin
- Western Bluebird
- Acorn Woodpecker
- Vesper Sparrow
- Pallid Bat
- Vaux's Swift
- Rufous Hummingbird
- Mountain Quail
- Western Meadowlark
- Ringtail

Group 5, Woodland Species

- Clouded Salamander
- Sharptail Snake
- Acorn Woodpecker
- Northern Pygmy Owl
- Pileated Woodpecker
- Ringtail
- Red-breasted sapsucker
- Olive-sided Flycatcher
- Pacific Slope Flycatcher
- Hermit Warbler
- Western Gray Squirrel

PLANT LIST

Scientific Name	Common Name	Exotic	Noxious	Status ¹
<i>ABIES GRANDIS</i>	GRAND FIR			
<i>ACER CIRCINATUM</i>	VINE MAPLE			
<i>ACER MACROPHYLLUM</i>	BIG LEAF MAPLE			
<i>ACHILLEA MILLEFOLIUM</i> SSP. <i>LANULOSA</i>	COMMON YARROW	Yes		
<i>ACHLYS TRIPHYLLA</i>	VANILLALEAF			
<i>ADENOCaulon BICOLOR</i>	PATHFINDER			
<i>ADIANTUM PEDATUM</i>	NORTHERN MAIDENHAIRFERN			
<i>AGOSERIS GRANDIFLORA</i>	LARGE FLOWERED AGOSERIS			
<i>AGOSERIS HETEROPHYLLA</i> VAR. <i>HETEROPHYLLA</i>	ANNUAL AGOSERIS			
<i>AGROSTIS ALBA</i>	BENTGRASS	Yes		
<i>AIRA CARYOPHYLLEA</i>	SILVER HAIRGRASS	Yes		
<i>ALCHEMILLA OCCIDENTALIS</i>	WESTERN LADY'S MANTLE			
<i>ALNUS RHOMBIFOLIA</i>	WHITE ALDER			
<i>ALOPECURUS PRATENSIS</i>	MEADOW FOXTAIL	Yes		
<i>AMSIACKIA INTERMEDIA</i>	RANCHERS FIDDLENECK			
<i>ANAGALLIS ARVENSIS</i>	SCARLET PIMPERNEL	Yes		
<i>ANEMONE DELTOIDEA</i>	WESTERN WHITE ANEMONE			
<i>ANTENNARIA RACEMOSA</i>	RACEME PUSSY TOES			
<i>ANTHEMIS ARVENSIS</i>	FIELD CHAMOMILE	Yes		
<i>ANTHEMIS COTULA</i>	MAYWEED CHAMOMILE	Yes		
<i>ANTHOXANTHUM ODORATUM</i>	SWEET VERNALGRASS	Yes		
<i>AQUILEGIA FORMOSA</i>	RED COLUMBINE			
<i>ARABIS KOEHLERI</i> VAR. <i>KOEHLERI</i>	SHRUBBY ROCKCRESS		BS	
<i>ARBUTUS MENZIESII</i>	PACIFIC MADRONE			
<i>ASARUM CAUDATUM</i>	WILD GINGER			
<i>ASTRAGALUS ACCIDENS</i>	THICKET MILK VETCH			
<i>AVENA BARBATA</i>	SLENDER OAT	Yes		
<i>BARBAREA VERNA</i>	BELLE ISLE CRESS	Yes		
<i>BELLIS PERENNIS</i>	ENGLISH DAISY	Yes		
<i>BERBERIS AQUIFOLIUM</i>	SHINING OREGON GRAPE			
<i>BERBERIS NERVOSA</i>	DULL OREGON GRAPE			
<i>BLECHNUM SPICANT</i>	DEER-FERN			
<i>BOYKINIA MAJOR</i>	MOUNTAIN BOYKINIA			
<i>BRASSICA CAMPESTRIS</i>	FIELD MUSTARD	Yes		
<i>BRASSICA NIGRA</i>	BLACK MUSTARD	Yes		
<i>BRIZA MINOR</i>	LITTLE QUAKING-GRASS	Yes		
<i>BRODIAEA CONGESTA</i>	CONGESTED BRODIAEA			
<i>BRODIAEA HENDERSONII</i>	HENDERSON'S BRODIAEA			
<i>BRODIAEA HYACINTHINA</i>	HYACINTH BRODIAEA			
<i>BRODIAEA PULCHELLA</i>	FIELD BRODIAEA			
<i>BROMUS CARINATUS</i>	CALIFORNIA BROME-GRASS			
<i>BROMUS MOLLIS</i>	SOFT BROME-GRASS	Yes		
<i>BROMUS RIGIDUS</i>	RIPGUT BROME-GRASS	Yes		
<i>BROMUS STERILIS</i>	POVERTY BROME	Yes		
<i>BROMUS TECTORUM</i>	CHEATGRASS	Yes		
<i>CALOCEDRUS DECURRENS</i>	INCENSE CEDER			
<i>CALOCHORTUS TOLMEII</i>	TOLMIE'S MARIPOSA LILY			
<i>CALYPSO BULBOSA</i>	FAIRY SLIPPER			
<i>CAMASSIA LEICHTLINII</i> VAR. <i>LEICHTLINII</i>	LEICHTLIN'S CAMAS			
<i>CAMASSIA QUAMASH</i>	COMMON CAMAS			

Scientific Name	Common Name	Exotic	Noxious	Status ¹
CARDAMINE OLIGOSPERMA	LITTLE WESTERN BITTERCRESS			
CARDAMINE PULCHERRIMA	SLENDER TOOTHWORT			
CARDUUS PYNOCOPHALUS	ITALIAN PLUMELESS THISTLE	Yes	Yes	
CAREX ATHROSTACHYA	SLENDERBEAK SEDGE			
CAREX DENSE	DENSE SEDGE			
CAREX DEWEYANA	DEWEY SEDGE			
CAREX GYNODYNAMA				TR
CAREX OBNUPTA	SLOUGH SEDGE			
CAREX PACHYSTACHYA	OLNEY'S HAIRY SEDGE			
CAREX SERRATODENS	SAW-TOOTH SEDGE			AS
CAREX STIPATA	OWLFRUIT SEDGE			
CAREX TUMULICOLA	SPLITAWN SEDGE			
CAREX UNILATERALIS	LATERAL SEDGE			
CEANOTHUS CUNEATUS	COMMON BUCKBRUSH			
CEANOTHUS INTEGERRIMUS	DEERBRUSH			
CEANOTHUS SANGUINEUS	REDSTEM CEANOTHUS			
CENTAUREA PRATENSIS	MEADOW KNAPWEED	Yes	Yes	
CENTAUREA SOLSTITIALIS	YELLOW STAR-THISTLE	Yes	Yes	
CENTAURIUM UMBELLATUM	COMMON CENTAURY	Yes		
CERASTIUM ARVENSE	FIELD CHICKWEED	Yes		
CERASTIUM VISCOSUM	STICKY CHICKWEED	Yes		
CERASTIUM VULGATUM	COMMON CHICKWEED	Yes		
CHRYSANTHEMUM LEUCANTHEMUM	OXEYE DAISY	Yes		
CICHORIUM INTYBUS	WILD CHICORY	Yes		
CICUTA DOUGLASII	WESTERN WATER-HEMLOCK	Yes	Yes	
CIRCAEA ALPINA	ENCHANTER'S NIGHT SHADE			
CIRSIIUM ARVENSE	CANADA THISTLE	Yes	Yes	
CIRSIIUM REMOTIFOLIUM	WEAK THISTLE			
CIRSIIUM VULGARE	COMMON THISTLE	Yes	Yes	
CLARKIA QUADRIVULNERA	SMALL-FLOWERED CLARKIA			
CLAYTONIA LANCEOLATA	WESTERN SPRINGBEAUTY			
CLAYTONIA PARVIFLORA	STREAMBANK SPRINGBEAUTY			
CLAYTONIA RUBRA	REDSTEM SPRINGBEAUTY			
CLINTONIA UNIFLORA	QUEEN'S CUP			
COLLINSIA GRANDIFLORA	LARGE-FLOWERED BLUE EYED MARY			
COLLINSIA RATTANII	RATTAN'S COLLINSIA			
CONVOLVULUS ARVENSIS	FIELD MORNING GLORY	Yes	Yes	
CONVOLVULUS NYCTAGINEUS	NIGHT-BLOOMING MORNING GLORY			
CORALLORHIZA STRIATA	STRIPED CORALROOT			
CORNUS NUTTALLII	WESTERN FLOWERING DOGWOOD			
CORNUS STOLONIFERA VAR. OCCIDENTALIS	CREST DOGWOOD			
CORYLUS CORNUTA VAR. CALIFORNICA	HAZELNUT			
CRATAEGUS DOUGLASII	BLACK HAWTHORN			
CRATAEGUS MONOGYNA	ONE-SEEDED HAWTHORN	Yes		Yes (Douglas County) Yes
CREPIS CAPILLARIS	SMOOTH HAWKSBEARD			
CRYPTANTHA INTERMEDIA VAR. GRANDIFLORA	COMMON CRYPTANTHA			
CYNOGLOSSUM GRANDE	PACIFIC HOUND'S TONGUE			
CYNOSURUS CRISTATUS	CRESTED DOGTAIL GRASS	Yes		
CYNOSURUS ECHINATUS	HEDGEHOG DOGTAIL GRASS	Yes		
CYSTOPTERIS FRAGILIS	BRITTLE BLADDER-FERN			
CYTISUS SCOPARIUS	SCOT'S BROOM	Yes	Yes	

Scientific Name	Common Name	Exotic	Noxious	Status ¹
<i>DACTYLIS GLOMERATA</i>	ORCHARDGRASS	Yes		
<i>DANTHONIA CALIFORNICA</i>	CALIFORNIA OATGRASS			
<i>DANTHONIA UNISPLICATA</i>	FEW-FLOWERED WILD OATGRASS			
<i>DAUCUS CAROTA</i>	WILD CARROT	Yes		
<i>DAUCUS PUSILLUS</i>	AMERICAN CARROT			
<i>DELPHINIUM MENZIESII</i>	MENZIES' LARKSPUR			
<i>DESCHAMPSIA CAESPITOSA</i>	TUFTED HAIRGRASS			
<i>DESCHAMPSIA ELONGATA</i>	SLENDER HAIRGRASS			
<i>DIANTHUS ARMERIA</i>	DEPTFORD PINK	Yes		
<i>DICENTRA FORMOSA</i>	BLEEDINGHEART			
<i>DICHELOSTEMMA IDA-MAIA</i>	FIRECRACKER FLOWER			TR
<i>DIGITALIS PURPUREA</i>	FOXGLOVE	Yes		
<i>DIPSACUS SYLVESTRIS</i>	COMMON TEASEL	Yes		
<i>DODECATHEON HENDERSONII</i>	HENDERSON'S SHOOTING STAR			
<i>DRABA VERNA</i>	SPRING WHITLOW-GRASS	Yes		
<i>DRYOPTERIS ARGUTA</i>	COASTAL SHIELD FERN			
<i>ELYMUS GLAUCUS</i> VAR. <i>JEPSONII</i>	WESTERN RYEGRASS			
<i>EPILOBIUM ANGUSTIFOLIUM</i>	FIREWEED			
<i>EPILOBIUM CILIATUM</i>	WATSON'S WILLOW HERB			
<i>EQUISETUM ARVENSE</i>	COMMON HORSETAIL	Yes		
<i>EQUISETUM HYEMALE</i>	COMMON SCOURING-RUSH			
<i>EQUISETUM TELMATEIA</i> VAR. <i>BRAUNII</i>	GIANT HORSETAIL	Yes	Yes	
<i>EREMOCARPUS SETIGERUS</i>	TURKEY MULLEIN			
<i>ERIOGONUM NUDUM</i>	BARESTEM BUCKWHEAT			
<i>ERIOPHYLLUM LANATUM</i> VAR. <i>ACHILLAEOIDES</i>	WOOLY SUNFLOWER			
<i>ERODIUM CICUTARIUM</i>	STORK'S BILL	Yes		
<i>ERYSIMUM ASPERUM</i>	PRAIRIE ROCKET			
<i>ERYTHRONIUM OREGONUM</i>	GIANT FAWN-LILY			
<i>ESCHSCHOLZIA CALIFORNICA</i>	GOLD POPPY			
<i>FESTUCA ARUNDINACEA</i>	TALL FESCUE	Yes		
<i>FESTUCA BROMOIDES</i>	SMALL FESCUE	Yes		
<i>FESTUCA CALIFORNICA</i>	CALIFORNIA FESCUE			
<i>FESTUCA IDAHOENSIS</i>	IDAHO FESCUE			
<i>FESTUCA MEGALURA</i>	FOXTAIL FESCUE			
<i>FESTUCA MICROSTACHYSSMALL FESCUE</i>		Yes		
<i>FESTUCA OCCIDENTALIS</i>	WESTERN FESCUE			
<i>FESTUCA ROEMERI</i>	ROEMER'S FESCUE			
<i>FESTUCA RUBRA</i>	RED FESCUE			
<i>FRAGARIA VESCA</i> VAR. <i>BRACTEATA</i>	WOODS STRAWBERRY			
<i>FRAGARIA VESCA</i> VAR. <i>CRINITA</i>	WOODS STRAWBERRY			
<i>FRAXINUS LATIFOLIA</i>	OREGON ASH			
<i>FRITILLARIA LANCEOLATA</i>	MISSION BELLS			
<i>GALIUM APARINE</i>				
<i>GAULTHERIA SHALLON</i>	SALAL			
<i>GERANIUM CAROLINIANUM</i>	CAROLINA GERANIUM			
<i>GERANIUM COLUMBINUM</i>	LONG-STALKED GERANIUM	Yes		
<i>GERANIUM DISSECTUM</i>	CUT-LEAFED GERANIUM	Yes		
<i>GERANIUM MOLLE</i>	DOVEFOOT GERANIUM	Yes		
<i>GEUM MACROPHYLLUM</i> VAR. <i>GILIA CAPITATA</i> VAR. <i>CAPITATA</i>	OREGON AVENS			
<i>GLYCERIA ELATA</i>	MACROPHYLLUM			
<i>HERACLEUM LANATUM</i>	BLUEFIELD GLIA			
	TALL MANNA GRASS			
	COW PARSNIP			

Scientific Name	Common Name	Exotic	Noxious	Status ¹
<i>HIERACIUM ALBIFLORUM</i>	WHITE FLOWERED HAWKWEED			
<i>HOLCUS LANATUS</i>	COMMON VELVETGRASS	Yes		
<i>HOLODISCUS DISCOLOR</i>	CREAMBUSH OCEAN-SPRAY			
<i>HORDEUM BRACHYANTHERUM</i>	MEADOW BARLEY			
<i>HORDEUM JUBATUM</i>	SQUIRRELTAIL BARLEY			
<i>HORDEUM MURINUM</i>	MOUSE BARLEY	Yes		
<i>HYPERICUM PERFORATUM</i>	COMMON ST. JOHNS WORT	Yes	Yes	
<i>HYPOCHAERIS GLABRA</i>	SMOOTH CATS EAR	Yes		
<i>HYPOCHAERIS RADICATA</i>	SPOTTED CATS EAR			
<i>IRIS CHRYSOPHYLLA</i>	SLENDER TOOTHED IRIS			
<i>IRIS TENAX</i>	OREGON IRIS			
<i>JUNCUS BUFONIUS</i>	TOAD RUSH			
<i>JUNCUS EFFUSUS</i>	COMMON RUSH			
<i>JUNCUS PATENS</i>	SPREADING RUSH			
<i>JUNCUS TENUIIS</i>	POVERTY RUSH			
<i>LAMIUM PURPUREUM</i>	PURPLE DEAD NETTLE	Yes		
<i>LATHYRUS APHACA</i>	YELLOW PEA	Yes		
<i>LATHYRUS SPHAERICUS</i>	GRASS PEAVINE	Yes		
<i>LEMNA MINOR</i>	WATER LENTIL			
<i>LIGUSTICUM APIFOLIUM</i>	CELERY-LEAFED LOVAGE			
<i>LIMNANTHES DOUGLASII</i>	DOUGLAS' MEADOWFOAM			
<i>LINANTHUS BICOLOR</i>	TRUE BABYSTARS			
<i>LINNAEA BOREALIS</i> VAR. LONGIFLORA	WESTERN TWINFLOWER			
<i>LINUM ANGUSTIFOLIUM</i>	NARROW-LEAFED FLAX	Yes		
<i>LITHOPHRAGMA BULBIFERA</i>	BULBIFEROUS FRINGECUP			
<i>LITHOPHRAGMA PARVIFLORA</i>	SMALL FLOWERED FRINGECUP			
<i>LOLIUM MULTIFLORUM</i>	ITALIAN RYEGRASS	Yes		
<i>LOLIUM PERENNE</i>	ENGLISH RYEGRASS	Yes		
<i>LOLIUM RIGIDUM</i>	WIMMERA RYEGRASS	Yes		
<i>LOMATIUM HALLII</i>	HALL'S LOMATIUM			
<i>LOMATIUM UTRICULATUM</i>	COMMON LOMATIUM			
<i>LONICERA HISPIDULA</i>	HAIRY HONEYSUCKLE			
<i>LOTUS CORNICULATUS</i>	BIRDSFOOT-TREFOIL	Yes		
<i>LOTUS MICRANTHUS</i>	SMALL-FLOWERED DEERVETCH			
<i>LOTUS PINNATUS</i>	MEADOW DEERVETCH			
<i>LUINA NARDOSMIA</i> VAR. <i>GLABRATA</i>	SILVERCROWN LUINA			
<i>LUPINUS BICOLOR</i>	TWO-COLOR LUPINE			
<i>LUZULA CAMPESTRIS</i>	FIELD WOODRUSH			
<i>LYTHRUM HYSSOPIFOLIA</i>	HYSSOP LOOSESTRIFE			
<i>MADIA MADIOIDES</i>	WOODLAND TARWEED			
<i>MAIANTHEMUM STELLATUM</i>	STARRY FALSE SOLOMON'S SEAL			
<i>MALVA NEGLECTA</i>	COMMON MALLOW			
<i>MARAH OREGANUS</i>	OREGON WILD CUCUMBER			
<i>MATRICARIA MATRICARIOIDES</i>	PINEAPPLE WEED			
<i>MEDICAGO ARABICA</i>	SPOTTED MEDICK	Yes		
<i>MELICA GEYERI</i>	GEYER'S ONIONGRASS			
<i>MELICA HARFODII</i>	HARFORDS MELIC			
<i>MELICA SPECTABILIS</i>	PURPLE ONIONGRASS			
<i>MELICA SUBULATA</i>	ALASKA ONIONGRASS			
<i>MENTHA PULEGIUM</i>	PENNYROYAL	Yes		
<i>MICROPUS CALIFORNICUS</i>	SLENDER COTTONWEED			
<i>MIMULUS ALSINOIDES</i>	CHICKWEED MONKEY-FLOWER			
<i>MIMULUS GUTTATUS</i> VAR. DEPAUPERATUS	YELLOW MONKEY-FLOWER			

Scientific Name	Common Name	Exotic	Noxious	Status ¹
MONARDELLA ODORATISSIMA	MONARDELLA			
MONTIA FONTANA	WATER CHICKWEED			
MONTIA SIBIRICA	SIBIRIAN MONTIA			
MYOSOTIS DISCOLOR	YELLOW AND BLUE FOGET-ME-NOT	Yes		
NAVARRETTIA INTERTEXTA VAR. INTERTEXTA	NEEDLE-LEAF NAVARRETTIA			
NEMOPHILA MENZIESII VAR. ATOMARIA	BABY BLUE-EYES			
NEMOPHILA PARVIFLORA	SMALL-FLOWERED NEMOPHILA			
ORTHOCARPUS ATTENUATUS	NARROW-LEAVED OWL-CLOVER			
OSMORHIZA CHILENSIS	MOUNTAIN SWEET-ROOT			
OXALIS SUKSDORFII	WESTERN YELLOW OXALIS			
PACHISTIMA MYRSINITES	OREGON BOXWOOD			
PARENTUCHELLIA VISCOSA	YELLOW PARENTUCHELLIA	Yes		
PELLAEA ANDROMEDAEOFOLIA	COFFEE-FERN			AS
PERIDERIDIA ERYTHORRHIZA	FALSE CARAWAY			BS
PERIDERIDIA HOWELLII	HOWELL'S FALSE CARAWAY			TR
PHACELIA CAPITATA	SCORPIONWEED			
PHACELIA HASTATA	SILVERLEAF PHACELIA			
PHACELIA HETEROPHYLLA VAR. HETEROPHYLLA	VARILEAF PHACELIA			
PHILADELPHUS LEWISII	MOCK ORANGE			
PHORADENDRON VILLOSUM	MISTLETOE			
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK			
PINUS PONDEROSA	PONDEROSA PINE			
PIPERIA UNALASCENSIS	ALASKA REIN ORCHID			
PITYROGRAMMA TRIANGULARIS	GOLDBACK FERN			
PLAGIOBOTHRYIS HIRTUS	ROUGH POPCORN FLOWER FP			
PLAGIOBOTHRYIS NOTHOFULVUS	RUSTY PLAGIOBOTHRYIS			
PLANTAGO LANCEOLATA	BUCKHORN PLANTAIN	Yes		
PLANTAGO MAJOR VAR. MAJOR	COMMON PLANTAIN			
PLECTRITIS CONGESTA	ROSY PLECTRITIS			
POA ANNUA	ANNUAL BLUEGRASS	Yes		
POA BULBOSA	BULBOUS BLUEGRASS	Yes		
POA PRATENSIS	KENTUCKY BLUEGRASS	Yes		
POLYPODIUM GLYCRRHIZA	LICORICE-FERN			
POLYPODIUM HESPERIUM	LICORICE FERN			
POLYPOGON INTERRUPTUS	DITCH POLYPOGON	Yes		
POLYPOGON MONSPELIENSIS	ANNUAL RABBITSFOOT GRASS	Yes		
POLYSTICHUM MUNITUM	COMMON SWORD FERN			
POTENTILLA GRACILIS VAR. GRACILIS	SLENDER CINQUEFOIL			
PRUNUS SUBCORDATA	WESTERN PLUM			
PRUNUS VIRGINIANA VAR. DEMISSA	WESTERN CHOKECHERRY			
PSEUDOTSUGA MENZIESII	DOUGLAS FIR			
PSILOCARPUS TENELLUS VAR. TENELLUS	SLENDER WOOLLY-HEAD			
PTERIDIUM AQUILINUM VAR. PUBESCENS	BRACKEN FERN			
QUERCUS GARRYANA	OREGON WHITE OAK			
QUERCUS KELLOGGII	KELLOGG'S OAK			
RANUNCULUS LOBBII	LOBB'S WATER-BUTTERCUP			
RANUNCULUS MURICATUS	SPINY-FRUIT BUTTERCUP			
RANUNCULUS OCCIDENTALIS VAR. OCCIDENTALIS	WESTERN BUTTERCUP			

Scientific Name	Common Name	Exotic	Noxious	Status ¹
RANUNCULUS ORTHORHYNCHUS	STRAIGHTBEAK BUTTERCUP			
RANUNCULUS UNcinATUS	LITTLE BUTTERCUP			
RHAMNUS PURSHIANA	CASCARA			
RHUS DIVERSILOBA	POISON OAK			
RIBES SANGUINEUM	RED CURRANT			
ROMANZOFFIA CALIFORNICA	CALIFORNIA MISTMAIDEN			
ROMANZOFFIA THOMPSONII	THOMPSON'S MISTMAIDEN			BS
RORIPPA CURVISILIIQUA VAR. CURVISILIIQUA	WESTERN YELLOWCRESS			
RORIPPA NASTURIUM-AQUATICUM	WATER-CRESS	Yes		
ROSA EGLANTERIA	SWEETBRIAR	Yes		
ROSA GYMNOCARPA	LITTLE WILD ROSE			
RUBUS DISCOLOR	HIMALAYAN BLACKBERRY	Yes		
RUBUS LACINIATUS	EVERGREEN BLACKBERRY	Yes		
RUBUS LEUCODERMIS	BLACKRASPBERRY			
RUBUS PARVIFLORUS	THIMBLEBERRY			
RUBUS URSINUS	PACIFIC BLACKBERRY			
RUMEX ACETOSELLA	FIELD SORREL	Yes		
RUMEX CRISPUS	CURLEY DOCK	Yes		
SAMBUCUS CERULEA VAR. CERULEA	BLUE ELDERBERRY			
SANGUISORBA MINOR	GARDEN BURNET	Yes		
SANICULA BIPINNATIFIDA	PURPLE SANICLE			
SANICULA CRASSICAULIS VAR. CRASSICAULIS	PACIFIC SANICLE			
SANICULA CRASSICAULIS VAR. TRIPARTITA	PACIFIC SANICLE			
SATUREJA DOUGLASII	YERBA BUENA			
SAXIFRAGA GORMANII	GORMAN'S SAXIFRAGE			
SAXIFRAGA HOWELLII	HOWELL'S SAXIFRAGE			
SAXIFRAGA INTEGRIFOLIA	SWAMP SAXIFRAGE			
SAXIFRAGA NUTTALLII	NUTTALL'S SAXIFRAGE			
SEDUM SPATHULIFOLIUM	BROAD-LEAFED STONECROP			
SELAGINELLA WALLACEI	WALLACE'S SELAGINELLA			
SENECIO JACOBAEA	TANSY RAGWORT	Yes	Yes	
SENECIO VULGARIS	COMMON GROUNDSEL	Yes		
SHERARDIA ARVENSIS	BLUE FIELD MADDER	Yes		
SIDALCEA VIRGATA	ROSE CHECKER MALLOW			
SILENE GALLICA	WINDMILL PINK	Yes		
SILENE HOOKERI SSP. HOOKERI	HOOKER'S SILENE			
SILYBUM MARIANUM	MILKTHISTLE	Yes	Yes	
SISYRINCHIUM ANGUSTIFOLIUM	NARROWLEAF BLUEEYED GRASS			
SISYRINCHIUM BELLUM	BLUE-EYED GRASS			
SISYRINCHIUM DOUGLASII	GRASS WIDOWS			
SISYRINCHIUM HITCHCOCKII	HITCHCOCKS BLUE-EYED GRASS			BS
SMILACINA STELLATA	STARRY FALSE SOLOMON'S SEAL			
SOCHUS ASPER	PRICKLY SOWTHISTLE	Yes		
SPERGULARIA RUBRA	RED SANDSPURRY	Yes		
STACHYS RIGIDA	RIGID HEDGE NETTLE			
STELLARIA CRISPA	CRISPED STARWORT			
STELLARIA MEDIA	COMMON CHICKWEED	Yes		
STIPA LEMMONII	LEMMON'S NEEDLEGRASS			
SYMPHORICARPOS ALBUS VAR. LAEVIGATUS	COMMON SNOWBERRY			
SYMPHORICARPOS MOLLIS VAR. HESPERIUS	CREEPING SNOWBERRY			

Scientific Name	Common Name	Exotic	Noxious	Status ¹
<i>SYNTHYRIS RENIFORMIS</i>	SNOW QUEEN			
<i>TAENIATHERUM ASPERUM</i>	MEDUSAHEAD WILDRYE	Yes		
<i>TANACETUM VULGARE</i>	COMMON TANSY	Yes		
<i>TARAXACUM LAEVIGATUM</i>	RED SEEDED DANDELION	Yes		
<i>TARAXACUM OFFICINALE</i>	COMMON DANDELION	Yes		
<i>TELLIMA GRANDIFLORA</i>	FRINGECUP			
<i>THALICTRUM OCCIDENTALIS</i>	WESTERN MEADOWRUE			
<i>THYSANOCARPUS CURVIPES</i>	SAND FRINGEPOD			
<i>TILLAEA ERECTA</i>	ERECT PYGMY WEED			
<i>TOLMIEA MENZIESII</i>	YOUTH ON AGE			
<i>TONELLA TENELLA</i>	SMALL-FLOWERED TONELLA			
<i>TORILIS ARVENSIS</i>	FIELD HEDGE-PARSLEY	Yes		
<i>TRAGOPOGON DUBIUS</i>	YELLOW SALSIFY	Yes		
<i>TRENTALIS LATIFOLIA</i>	WESTERN STARFLOWER			
<i>TRIFOLIUM ANGUSTIFOLIUM</i>	NARROW-LEAVED CLOVER	Yes		
<i>TRIFOLIUM BIFIDUM</i>	NOTCHLEAF CLOVER			
<i>TRIFOLIUM CILIOLATUM</i>	FOOTHILL CLOVER			
<i>TRIFOLIUM DUBIUM</i>	LEAST HOP CLOVER	Yes		
<i>TRIFOLIUM ERIOPHALUM</i> VAR. <i>ERIOPHALUM</i>	WOOLLY-HEAD CLOVER			
<i>TRIFOLIUM MACRAEI</i>	MACRAE'S CLOVER			
<i>TRIFOLIUM MICROCEPHALLUM</i>	SMALLHEAD CLOVER			
<i>TRIFOLIUM PRATENSE</i>	RED CLOVER	Yes		
<i>TRIFOLIUM REPENS</i>	WHITE CLOVER	Yes		
<i>TRIFOLIUM SUBTERRANEUM</i>	SUBTERRANEAN CLOVER	Yes		
<i>TRIFOLIUM TRIDENTATUM</i>	SAND CLOVER			
<i>TRIFOLIUM VARIEGATUM</i>	WHITE-TIP CLOVER			
<i>TRILLUM OVATUM</i>	WESTERN TRILLUM			
<i>TYPHA LATIFOLIA</i>	CATTAIL			
<i>UMBELLULARIA CALIFORNICA</i>	CALIFORNIA LAUREL			
<i>URTICA DIOICA</i> VAR. <i>LAYALLII</i>	LYALL NETTLE			
<i>VANCOUVERIA HEXANDRA</i>	WHITE INSIDE-OUT-FLOWER			
<i>VERATRUM INSOLITUM</i>	SISKIYOU FALSE HELLEBORE			
<i>VERBASCUM BLATTERIA</i>	MOTH MULLEIN	Yes		
<i>VERBASCUM THAPSUS</i>	COMMON MULLEIN	Yes		
<i>VERONICA AMERICANA</i>	AMERICAN BROOKLIME			
<i>VERONICA ARVENSIS</i>	WALL SPEEDWELL	Yes		
<i>VICIA CRACCA</i>	BIRD VETCH	Yes		
<i>VICIA HIRSUTA</i>	TINY VETCH	Yes		
<i>VICIA SATIVA</i>	COMMON VETCH	Yes		
<i>VICIA TETRASPHERMA</i>	SLENDER VETCH	Yes		
<i>VIOLA HOWELLII</i>	HOWELL'S VIOLET			
<i>WHIPPLEA MODESTA</i>	WHIPPLEVINE			
<i>WOODWARDIA FIMBRIATA</i>	GIANT CHAIN FERN			
<i>XANTHIUM SPINOSUM</i>	SPINY COCKLEBUR	Yes	Yes	
<i>ZIGANDENUS VENENOSUS</i>	MEADOW DEATH CAMAS			

¹ Status

BS - Bureau Sensitive

TR - Tracking Species

AS - Bureau Assessment Species

FP - Federally Protected (proposed Endangered)

Appendix 3

AVIFAUNA LIST FOR THE NORTH BANK HABITAT MANAGEMENT AREA

RAPTORS

1. Bald Eagle.....	<i>Haliaeetus leucocephalus</i>
2. Golden Eagle.....	<i>Aquila chrysaetos</i>
3. Red-tailed Hawk.....	<i>Buteo jamaicensis</i>
4. Northern Harrier.....	<i>Circus cyaneus</i>
5. Sharp-shinned Hawk.....	<i>Accipiter striatus</i>
6. Cooper's Hawk.....	<i>Accipiter cooperi</i>
7. American Kestrel.....	<i>Falco sparverius</i>
8. Merlin.....	<i>Falco columbarius</i>
9. Peregrine Falcon.....	<i>Falco peregrinus</i>
10. Prairie falcon.....	<i>Falco mexicanus</i>
11. Black-shouldered Kite.....	<i>Elanus caeruleus</i>
12. Rough-legged Hawk.....	<i>Buteo lagopus</i>
13. Osprey.....	<i>Pandion haliaetus</i>
14. Great-horned Owl.....	<i>Bubo virginianus</i>
15. Barred Owl.....	<i>Strix varia</i>
16. Barn Owl.....	<i>Tyto alba</i>
17. Screech Owl.....	<i>Otus kennicotti</i>
18. Pygmy Owl.....	<i>Glaucidium gnoma</i>
19. Saw-whet Owl.....	<i>Aegolius acadicus</i>
20. Spotted Owl.....	<i>Strix occidentalis</i>
21. Turkey Vulture.....	<i>Cathartes aura</i>

WATERFOWL

1. Canada Goose.....	<i>Branta canadensis</i>
2. Mallard.....	<i>Anas platyrhynchos</i>
3. Green-winged Teal.....	<i>Anas creca</i>
4. Wood Duck.....	<i>Aix sponsa</i>
5. Hooded Merganser.....	<i>Lophodytes cucullatus</i>
6. Common Merganser.....	<i>Mergus merganser</i>
7. Ring-neck Duck.....	<i>Aithya collaris</i>
8. Greater Scaup.....	<i>Aithya marila</i>
9. Lesser Scaup.....	<i>Aithya affinis</i>
10. Western Grebe.....	<i>Aechmophorus occidentalis</i>

WADING BIRDS

1. Green-backed Heron.....	<i>Butorides striatus</i>
2. Great Blue Heron.....	<i>Ardea herodias</i>
3. Great Egret.....	<i>Casmerodius albus</i>

SHOREBIRDS

1. Killdeer.....	<i>Charadrius vociferus</i>
2. Western Sandpiper.....	<i>Calidris mauri</i>
3. Common Snipe.....	<i>Gallinago gallinago</i>

KINGFISHER

1. Belted Kingfisher..... *Ceryle alcyon*

GROUSE, QUAIL, AND PHEASANTS

1. Blue Grouse..... *Dendragapus obscurus*
2. Ruffed Grouse..... *Bonasa umbellus*
3. California Quail..... *Callipepla californica*
4. Mountain Quail..... *Oreortyx picta*
5. Wild Turkey..... *Meleagris gallopavo*

PIGEONS AND DOVES

1. Band-tailed Pigeon..... *Columba fasciata*
2. Mourning Dove..... *Zenaida macroura*
3. Rock Dove..... *Columba livia*

JAYS AND CROWS

1. Steller's Jay..... *Cyanocitta stelleri*
2. Scrub Jay..... *Aphelocoma coerulescens*
3. Northwestern Crow..... *Corvus caurinus*
4. Common Raven..... *Corvus corax*

WOODPECKERS

1. Common Flicker..... *Colaptes auratus*
2. Pileated Woodpecker..... *Dryocopus pileatus*
3. Acorn Woodpecker..... *Melanerpes formicivorus*
4. Red-breasted Sapsucker..... *Sphyrapicus ruber*
5. Hairy Woodpecker..... *Picoides villosus*
6. Downy Woodpecker..... *Picoides pubescens*

GOATSUCKERS, SWIFTS AND HUMMINGBIRDS

1. Common Nighthawk..... *Chordeiles minor*
2. Vaux's Swift..... *Chaetura vauxi*
3. Anna's Hummingbird..... *Calypte anna*
4. Rufous Hummingbird..... *Selasphorus rufus*

SWALLOWS

1. Violet-Green Swallow..... *Tachycineta thalassina*
2. Barn Swallow..... *Hirundo rustica*
3. Tree Swallow..... *Tachycineta bicolor*
4. Rough-winged Swallow..... *Stelgidopteryx serripennis*
5. Cliff Swallow..... *Hirundo pyrrhonota*
6. Purple Martin..... *Progne subis*

DIPPERS

1. American Dipper..... *Cinclus mexicanus*

THRUSHES

- | | |
|------------------------------|----------------------------|
| 1. American Robin..... | <i>Turdus migratorius</i> |
| 2. Varied Thrush..... | <i>Ixoreus Bonaparte</i> |
| 3. Hermit Thrush..... | <i>Catharus guttatus</i> |
| 4. Swainson's Thrush..... | <i>Catharus ustulatus</i> |
| 5. Townsend's Solitaire..... | <i>Myadestes townsendi</i> |
| 6. Western Bluebird..... | <i>Sialia mexicana</i> |

WRENS

- | | |
|---------------------|--------------------------------|
| 1. House Wren..... | <i>Troglodytes aedon</i> |
| 2. Winter Wren..... | <i>Troglodytes troglodytes</i> |

MEADOWLARKS, BLACKBIRDS AND ORIOLES

- | | |
|------------------------------|-------------------------------|
| 1. Western Meadowlark..... | <i>Sturnella neglecta</i> |
| 2. Red-winged Blackbird..... | <i>Agelaius phoeniceus</i> |
| 3. Northern Oriole..... | <i>Icterus galbula</i> |
| 4. Brewer's Blackbird..... | <i>Euphagus cyanocephalus</i> |
| 5. Brown-headed Cowbird..... | <i>Molothrus ater</i> |

STARLINGS

- | | |
|---------------------------|-------------------------|
| 1. European Starling..... | <i>Sternus vulgaris</i> |
|---------------------------|-------------------------|

TANAGERS

- | | |
|-------------------------|----------------------------|
| 1. Western Tanager..... | <i>Piranga ludoviciana</i> |
|-------------------------|----------------------------|

WEAVER FINCHES

- | | |
|-----------------------|--------------------------|
| 1. House Sparrow..... | <i>Passer domesticus</i> |
|-----------------------|--------------------------|

VIREOS

- | | |
|------------------------|-------------------------|
| 1. Hutton's Vireo..... | <i>Vireo huttoni</i> |
| 2. Solitary Vireo..... | <i>Vireo solitarius</i> |
| 3. Warbling Vireo..... | <i>Vireo gilvus</i> |

TITMICE, BUSHTITS, NUTHATCHES AND CREEPERS

- | | |
|-----------------------------------|------------------------------|
| 1. Black-capped Chickadee..... | <i>Parus atricapillus</i> |
| 2. Chestnut-backed Chickadee..... | <i>Parus rufescens</i> |
| 3. Mountain Chickadee..... | <i>Parus gambeli</i> |
| 4. White-breasted Nuthatch..... | <i>Sitta carolinensis</i> |
| 5. Red-breasted Nuthatch..... | <i>Sitta canadensis</i> |
| 6. Brown Creeper..... | <i>Certhia americana</i> |
| 7. Wren-tit..... | <i>Chamaea fasciata</i> |
| 8. Common Bush-tit..... | <i>Psaltiriparus minimus</i> |

TYRANT FLYCATCHERS

1. Western Kingbird.....	<i>Tyrannus verticalis</i>
2. Western Wood Peewee.....	<i>Contopus sordidulus</i>
3. Ash-throated Flycatcher.....	<i>Myiarchus cinerascens</i>
4. Olive-sided Flycatcher.....	<i>Contopus borealis</i>
5. Dusky Flycatcher.....	<i>Empidonax oberholseri</i>
6. Hammond's Flycatcher.....	<i>Empidonax hammondi</i>
7. Willow Flycatcher.....	<i>Empidonax traillii</i>
8. Western Flycatcher.....	<i>Empidonax difficilis</i>

KINGLETS AND WAXWINGS

1. Golden-crowned Kinglet.....	<i>Regulus satrapa</i>
2. Ruby-crowned Kinglet.....	<i>Regulus calendula</i>
3. Cedar Waxwing.....	<i>Bombycilla cedrorum</i>
4. Bohemian Waxwing.....	<i>Bombycilla garrulus</i>

WOOD WARBLERS

1. Orange-crowned Warbler.....	<i>Vermivora celata</i>
2. Nashville Warbler.....	<i>Vermivora ruficapilla</i>
3. Yellow-rumped Warbler.....	<i>Dendroica coronata</i>
4. Black-throated Gray Warbler.....	<i>Dendroica nigrescens</i>
5. Townsend's Warbler.....	<i>Dendroica townsendi</i>
6. McGillyray's Warbler.....	<i>Oporornis tolmiei</i>
7. Wilson's Warbler.....	<i>Wilsonia pusilla</i>
8. Yellow Warbler.....	<i>Dendroica petechia</i>
9. Hermit Warbler.....	<i>Dendroica occidentalis</i>
10. Common Yellowthroat.....	<i>Geothlypis trichas</i>
11. Yellow-breasted Chat.....	<i>Icteria virens</i>

GROSBEAKS, FINCHES, SPARROWS AND BUNTINGS

1. Black-headed Grosbeak.....	<i>Pheucticus melanocephalus</i>
2. Evening Grosbeak.....	<i>Coccothraustes vespertinus</i>
3. Lazuli Bunting.....	<i>Passerina amoena</i>
4. Purple Finch.....	<i>Carpodacus purpureus</i>
5. House Finch.....	<i>Carpodacus mexicanus</i>
6. Pine Siskin.....	<i>Carduelis pinus</i>
7. American Goldfinch.....	<i>Carduelis tristis</i>
8. Lesser Goldfinch.....	<i>Carduelis psaltria</i>
9. Red Crossbill.....	<i>Loxia curvirostra</i>
10. Rufous-sided Towhee.....	<i>Pipilo erythrophthalmus</i>
11. Savannah Sparrow.....	<i>Passerculus sandwichensis</i>
12. Vesper Sparrow.....	<i>Poocetes gramineus</i>
13. Chipping Sparrow.....	<i>Spizella passerina</i>
14. White-crowned Sparrow.....	<i>Zonotrichia leucophrys</i>
15. Golden-crowned Sparrow.....	<i>Zonotrichia atricapilla</i>
16. Fox Sparrow.....	<i>Passerella iliaca</i>
17. Song Sparrow.....	<i>Melospiza melodia</i>
18. Dark-eyed Junco.....	<i>Junco hyemalis</i>

Appendix 4

MAMMALIAN SPECIES LIST FOR THE NORTH BANK HABITAT MANAGEMENT AREA

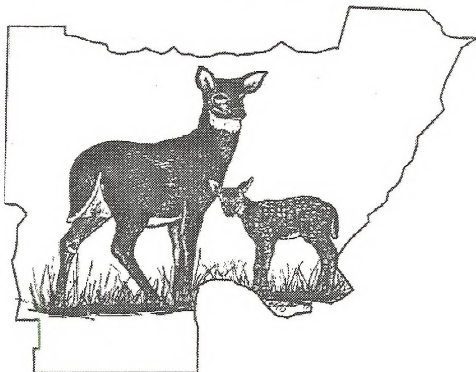
This list has been compiled with information gained through direct observation of the species or diagnostic signs and/or by utilizing known range and habitat affinities of some species.

- | | |
|-----------------------------|--|
| 1. Common Opossum | <i>Didelphis marsupialis</i> |
| 2. Trowbridge shrew | <i>Sorex trowbridgii</i> |
| 3. Vagrant shrew | <i>Sorex vagrans</i> |
| 4. Fog shrew | <i>Sorex sonomae</i> |
| 5. Shrew-mole | <i>Neurotrichus gibbsii</i> (Baird) |
| 6. Townsends mole | <i>Scapanus townsendii</i> (Bachman) |
| 7. Little Brown Myotis | <i>Myotis lucifugus</i> (LeConte) |
| 8. Yuma Myotis | <i>Myotis yumanensis</i> (H. Allen) |
| 9. Long-eared Myotis | <i>Myotis evotis</i> (H. Allen) |
| 10. Fringed Myotis | <i>Myotis thysanodes</i> (Miller) |
| 11. Hairy-winged Myotis | <i>Myotis volans</i> (H. Allen) |
| 12. California Myotis | <i>Myotis californicus</i> (Audubon and Bachman) |
| 13. Silvery-haired Bat | <i>Lasiorycteris noctivagans</i> (LeConte) |
| 14. Big Brown Bat | <i>Eptesicus fuscus</i> (Palisot de Beauvois) |
| 15. Lump Nosed Bat | <i>Plecotus townsendii</i> (Cooper) |
| 16. Pallid Bat | <i>Antrozous pallidus</i> (LeConte) |
| 17. Black-tailed Jackrabbit | <i>Lepus californicus</i> Gray |
| 18. Brush Rabbit | <i>Sylvilagus bachmanii</i> (Waterhouse) |
| 19. Calif. Ground Squirrel | <i>Otospermophilus beecheyi</i> (Richardson) |
| 20. Townsend Chipmunk | <i>Eutamias townsendii</i> (Bachman) |
| 21. W. Grey Squirrel | <i>Sciurus griseus</i> (Ord) |
| 22. Douglas Squirrel | <i>Tamiasciurus douglasii</i> (Bachman) |
| 23. N. Flying Squirrel | <i>Glaucomys sabrinus</i> (Shaw) |
| 24. Mazama Pocket Gopher | <i>Thomomys mazama</i> Merriam |
| 25. Beaver | <i>Castor canadensis</i> (Kuhl) |
| 26. Deer Mouse | <i>Peromyscus maniculatus</i> (Wagner) |
| 27. Dusky-footed Woodrat | <i>Neotoma fuscipes</i> (Baird) |
| 28. W. Red-Backed Mouse | <i>Clethrionomys occidentalis californica</i> |
| 29. Red Tree Mouse | <i>Phenacomys longicaudis</i> (True) |
| 30. Creeping Vole | <i>Microtus oregonii</i> (Bachman) |
| 31. Calif. Meadow Mouse | <i>Microtus californicus</i> (Peale) |
| 32. Muskrat | <i>Ondatra zibethica</i> (Linnaeus) |
| 33. House Mouse | <i>Mus musculus</i> (Linnaeus) |
| 34. Pacific Jumping Mouse | <i>Zapus trinotatus</i> (Rhoads) |
| 35. Porcupine | <i>Erethizon dorsatum</i> (Linnaeus) |
| 36. Nutria | <i>Myocastor coypu</i> (Molina) |
| 37. Coyote | <i>Canis latrans</i> (Say) |
| 38. Red Fox | <i>Vulpes fulva</i> (Desmarest) |
| 39. Gray Fox | <i>Urocyon cinereoargenteus</i> (Schreber) |
| 40. Black Bear | <i>Ursus americanus</i> (Pallus) |
| 41. Ringtail | <i>Bassariscus astutus</i> (Lichtenstein) |
| 42. Raccoon | <i>Procyon lotor</i> (Linnaeus) |
| 43. Ermine | <i>Mustela erminea</i> (Linnaeus) |
| 44. Long-Tailed Weasel | <i>Mustela frenata</i> (Lichtenstein) |
| 45. Mink | <i>Mustela vison</i> (Schreber) |

46. Spotted Skunk	<i>Spilogale putorius</i> (Linnaeus)
47. Striped Skunk	<i>Mephitis mephitis</i> (Schreber)
48. River Otter	<i>Lutra canadensis</i> (Schreber)
49. Cougar	<i>Felis concolor</i> (Linnaeus)
50. Bobcat	<i>Lynx rufus</i> (Schreber)
51. Roosevelt Elk	<i>Cervus canadensis roosevelti</i>
52. Blacktail Deer	<i>Odocoileus hemionus columbianus</i>
53. Columbian White-Tailed Deer	<i>Odocoileus virginianus leucurus</i>
54. Bushy-tailed woodrat	<i>Neotoma cinerea</i> (Ord)
55. Mountain Beaver	<i>Aplodontia rufa</i> (Rafinesque)

North Bank Habitat Management Area/ACEC

Draft Habitat Management Plan(HMP)



December 1999

U.S. Department of Interior
Bureau of Land Management
Roseburg, Oregon

In Cooperation with:
U.S. Fish and Wildlife Service
Oregon Dept. of Fish and Wildlife

777 NW Garden Valley Blvd
Roseburg, Oregon 97470





NBHMA Habitat Management Plan (HMP)

INTRODUCTION

The NBHMA Environmental Impact Statement analyzes potential impacts that could occur with the implementation of the various alternatives considered. Alternative C is the Agency's Proposed Action. This HMP is based on the implementation of that alternative and will show the various projects and management actions that would occur with the implementation of the proposed action.

GOALS

The Interdisciplinary (ID) Team established two broad goals that would guide all management actions on the NBHMA:

Primary Goal: Ensure that habitat for the CWTD and special status species is managed to maintain species viability over time.

Secondary Goal: Accommodate other uses that are compatible with the primary management goal.

ISSUES

Issues were identified and developed as the result of public meetings, comment letters received and the Interdisciplinary process. These issues were reviewed by the ID Team and consolidated into four "key" issues (see EIS, Chap. One).

1. **Columbian White-tailed Deer (CWTD) and Special Status Species**
2. **Recreational Use and Facility Development**
3. **Water Quality / Quantity**
4. **Riparian / Wetland Habitat**

EXISTING MANAGEMENT SITUATION

Present management is minimal and is described in the EIS as the No Action Alternative (Alternative A). Current management priorities are based on fulfilling legal mandates. All current roads are potentially available for management use, but roads are maintained only as necessary to gain access to implement a management action. All roads and trails (approximately 75 miles) are open to non-motorized recreation, cross-country travel and overnight camping and are not restricted except as posted. Motorized access to the Main Barn area is allowed by special permission. Hunting, hiking, mountain biking, equestrian and other non-motorized uses currently occur on the NBHMA, but without the support of developed facilities. Unrestricted parking is allowed within NBHMA boundaries at the West Entrance (school bus turn-around). Doc's Landing is open to motorized access, but the dirt road is deeply rutted. Many people park adjacent to County Road 200 and enter the NBHMA from the perimeter. Hunting is regulated by the Oregon Department of Fish and Wildlife. Normal fire suppression would have been employed as necessary, but vegetation has been allowed to progress through natural succession causing habitat changes over time.

The present road system is in need of improvement. Numerous road segments are impassable to traffic. Inadequate cross drains cause water to be diverted by the roads from one drainage to another, causing gullying and rutting. Rutting of the native-surface roads contributes to sedimentation and water diversion. Cut and fill slope instability is noted in several areas which prevents vehicle passage. Only sporadic, as-needed maintenance of roads has been undertaken by the BLM or Pacific Power and Light who has legal access to maintain the powerline right-of-way. The activities consist of blading the road surfaces, removing slide debris, and improving road drainage.

Numerous stream segments are not functioning properly, or are at risk (see EIS Figure 14, North Bank Riparian Functioning Condition). Channel degradation may be the result of past management practices. No management action has been taken to remedy these conditions. A small dam in the Chasm Creek drainage was breached several years ago. Only few springs are developed within the planning area.

Eleven special status plant species are known to occur on the NBHMA (Table 1). Red root yampah, Howell's false caraway, Hitchcock's blue-eyed grass, saw-toothed sedge, and firecracker plant occur in meadow and oak savanna habitat. The shrubby rock cress grows on basaltic rock outcrops. A portion of its habitat adjacent to the NBHMA has already been lost from quarry development and additional habitat has been impacted by wildfire. The coffee fern occurs on mossy covered rock outcroppings in two locations. The mistmaiden grows in open areas with shallow soils which are rocky and retain moisture. Popcorn flower occurs in open vernal wetlands and the crumia moss grows on rocks along streams. Olney's sedge occurs along meadow edges and in riparian hardwood forests. All of the species are currently managed in accordance with Bureau Special Status Species policy.

Table 1. Special Status Plant Species on the North Bank Habitat Management Area

Family	Species	Common Name
Apiaceae	<i>Perideridia erythrorhiza</i>	red root yampah
	<i>Perideridia howellii</i>	Howell's false caraway
Brassicaceae	<i>Arabis koehleri</i> var. <i>koehleri</i>	shrubby rockcress
Boraginaceae	<i>Plagiobothrys hirtus</i>	popcorn flower
Cyperaceae	<i>Carex gynodynema</i>	Olney's hairy sedge
	<i>Carex serratodens</i>	saw-tooth sedge
Hydrophyllaceae	<i>Romanzoffia thompsonii</i>	Thompson's mistmaiden
Iridaceae	<i>Sisyrinchium hitchcockii</i>	Hitchcock's blue-eyed grass
Liliaceae	<i>Dichelostemma ida-maia</i>	firecracker plant
Polypodiaceae	<i>Pellaea andromedaefolia</i>	coffee-fern
Pottiaceae	<i>Crumia latifolia</i>	crumia moss

The following specific management guidelines are presently in effect on the NBHMA:

1. **Roads and trails** - Motorized use is not permitted by the public except to access parking areas. State or federal personnel performing official duties or personnel conducting fire fighting or emergency activities may use motorized vehicles. Use of highway vehicles on maintained roads is seasonally limited to avoid rutting and other road damage during wet periods. Official use of ATV's is permitted on trails as well as maintained roads for research and management purposes. Personnel using motorized vehicles are responsible for avoiding road/trail degradation. Non-motorized use of maintained and non-maintained roads and trails by the public is allowed unless otherwise posted. Road and trail maintenance work would be conducted between May 15 and October 15 (dry season) or as conditions warrant.

2. **Recreation** - Hiking, mountain biking, equestrian use, hunting, primitive camping, environmental education, and other non-motorized uses are permitted. Restrictions on the number or type of use and location of use may be imposed as necessary to protect species of special concern and avoid degradation of ACEC values.

3. **Special Events** - These events are permitted on a case by case basis through an application process and issuance of special permit. Events are allowed only in non-sensitive areas consistent with the primary goal.

4. **Cultural Resources** - All projects of a ground disturbing nature would be inventoried for cultural resources prior to implementation to identify any cultural resources that could be disturbed. A public archaeology program at site 35D061 would be developed to provide educational opportunities.

5. **Wetlands Projects** - Work within the streams and riparian areas would be occur between May 15 and October 15 or as conditions warrant. Use of heavy equipment is avoided or limited to the dry season. The travel way for equipment traveling to isolated headcut sites would be limited and where possible confined to existing roads and trails. The work area around the headcut would be limited to control compaction at the site. A 25 foot buffer along streams is maintained for all projects within the riparian area except for those projects specifically targeting riparian improvement and instream work. Instream work will be accomplished between July 1 to September 15 to minimize adverse effects of sedimentation on aquatic organisms.

6. **Timber Production** - 400 acres have been designated for timber production. Harvest would be based on an 80 year rotation consistent with the 1993 Exchange EA and the Roseburg District RMP's guidelines for Connectivity / Diversity Blocks.

7. **Noxious Weeds** - Integrated Pest Management is used to control infestations of noxious weeds along roads, around buildings and recreation sites. Additional infestations would be controlled according to priorities. All tools including biological control, chemical, cultural, or mechanical methods could potentially be employed.

8. **Special Status Species** - Surveys, monitoring, and research on species of special concern (plant and animal) may be conducted to manage habitat for long-term viability.

HABITAT MANAGEMENT PLAN OBJECTIVES

This section of the plan presents the objectives that have arisen out of the major issues identified and the management actions that are proposed to resolve those issues. The Management Actions (MA) in the EIS are noted in parenthesis.

Issue 1: Columbian White-tailed Deer and Special Status Species

Objective #1

Manage vegetation to provide habitat and forage for CWTD.

Management Actions

- Use livestock to manipulate vegetation to improve habitat and forage for CWTD (MA 18).

Kind and Class of Livestock-Grazer selection

Livestock can be used to manipulate vegetation by grazing. Yearling to adult cattle (without calves) would be most compatible with CWTD. Yearling cattle are more mobile than cows with calves and would utilize uplands more effectively. Deer friendly fences would hold yearling or older cattle. Cattle eat grass primarily, so dietary overlap with CWTD is minimized. Sheep and goats were rejected due to dietary overlap with deer and the woven wire fences needed to contain these animals. Woven wire fences would be more likely to impede deer movement. Horses, llamas, alpacas and other livestock were rejected due to availability.

Grazing Units

Grazing Units were delineated by watersheds. Fences used to manage livestock would follow watershed boundaries and tend to be on ridges. Cross fencing may be installed to subdivide the basins and improve vegetation management.

Fencing

Rebuilding or repairing exterior fences are the first priority. These would typically be traditional stock fences of woven wire topped by barbed wire strands. Permanent "Exclusion Area" fences adjacent to grazing treatment areas would be built prior to livestock introduction in adjacent areas. In some cases "Exclusion Area" fences may serve as boundary fences. Interior fences that delineate grazing areas would be made of four strands of wire that facilitate deer and fawn passage. Boundary fences and interior fences that define grazing units are primary fences and will be constructed to be permanent. Primary fences on ridges or in the proximity of roads are less costly to access and maintain. Secondary fences that divide watersheds may be permanent or temporary. Some secondary fences may be used to prevent livestock access to natural springs, riparian areas and/or sites of recent improvements. Fences will be built as needed. Proposed fences tend to follow current or previous fence lines. Areas for grazing treatments will be prioritized by an interdisciplinary team. Initially, three areas were selected: Blacktail Basin/Jackson Creek, Whitetail Basin and Soggy Bottoms. Additional grazing areas will be selected based on need for treatment and results achieved by previous treatments.

Corrals and Livestock Handling Facilities

Two sites have been identified for these facilities, one on the east side near the main barn and one on the west side approximately 1/4 mile from the west gate. Locations were selected to minimize livestock handling. Permanent construction facilities would be located outside of riparian areas and sensitive areas.

Livestock Distribution

Supplement blocks would be used to improve livestock distribution. They would be placed to increase utilization over the grazing unit and in a specific areas.

Water Developments for Livestock

Water developments could be used to distribute cattle over the treatment area. See later discussion on Water Developments.

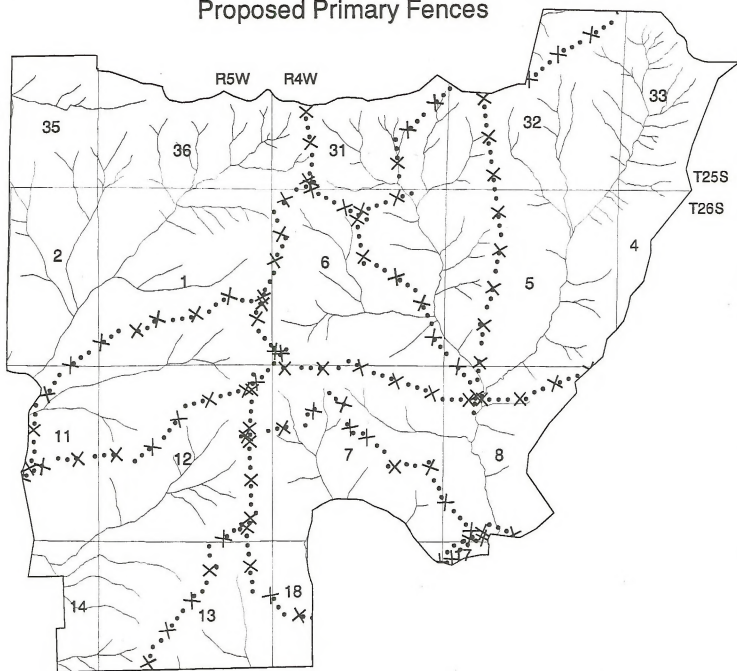
Grazing System and Timing

Timing and stocking rates are based on the vegetation manipulation needed to maintain or improve habitat, not on the maximum benefit to cattle or livestock operators. All areas treated with grazing would be subject to rest-rotation or deferment. Grazing units would be grazed no more than three times in a five year period and no areas would be grazed year round. This rest-rotation program will allow plants to recover, vegetative changes to occur, seedings to establish and assessment of the grazing treatment

Figure 1

North Bank Habitat Management Area

Proposed Primary Fences



Legend

Scale 1:37000

0.5 0 0.5 1 Miles

Permanent Proposed Fences
Streams

Grazing in Conjunction with Other Vegetation Management Techniques

Use hoof action for seed bed prep or planting in some areas. Concentrated hoof action could prepare a seed bed or work broadcast seed into the soil. This especially helpful in areas that are inaccessible to equipment. Use or defer grazing to regulate fuel loads for controlled burning. Use grazing to utilize and reduce vigor of annual grasses and encourage growth and reproduction of perennial native grasses and forbs. Apply fertilizer to invigorate perennial forbs and/or grasses and give them a competitive advantage after cattle are removed.

Exclusion areas

Three areas totaling approximately 740 acres would be permanently excluded from grazing, these areas can act as comparison areas for treated acres on similar sites. Susceptible special status plant sites and targeted noxious weed sites will be excluded from grazing to prevent additional spread of high priority weeds. Livestock would be excluded from natural springs, sensitive riparian areas and/or sites of recent improvements (forage plots, seedings, stream restoration work, erosion control structures, etc.) If damage to these areas is observed.

Rationale: Increasingly available forbs and succulent young grass would provide higher quality forage for CWTDD. Livestock grazing would be used as a tool to:

- Improve habitat for forbs and succulent grass growth by removing rank vegetation and thatch.
- Increase native and desirable perennial grasses by reducing rank vegetation and reducing competition from annual grasses.
- Decrease annual non-native grasses that have little to no forage value or soil holding capacity.
- Treat areas inaccessible to equipment where mowing, plowing, drilling is not practical.

Policy

- Standards and Guides for Rangeland Health would be followed to guide grazing treatment practices.
- **Use prescribed burning to maintain habitat types needed by CWTDD, invigorate shrub species, and control conifer encroachment in oak woodlands and meadows.**

Grassland/oak savannah - Use controlled burns at three to five year intervals to rejuvenate grazed grassland/oak savannah. Ungrazed areas would be burned at intervals no greater than three years (MA 18). **Rationale:** Reduce standing dead grass stems that lack nutrients and shade out more desirable forb species.

Senescent shrub patches - Burn at five to seven year intervals to encourage new, more palatable growth and to maintain cover. If shrub areas cannot be isolated with fire trails, then burn at three to five year intervals along with associated grassland habitat areas. **Rationale:** Remove larger woody portions of shrubs and stimulate growth of more palatable browse.

When possible, burns would be timed to discourage annual grasses and increase viability of perennial grasses and forbs. **Rationale:** Improve forage quality and quantity.

Oak woodland - Ensure that all oak woodland areas are underburned at intervals no greater than eight years. **Rationale:** Control conifer encroachment, reduce fuel loading, and stimulate understory shrub and forb species.

Selectively cut existing conifers in oak woodland areas, where needed prior to burning. **Rationale:** Control conifer encroachment, reduce fuel loading and reduce fire intensity.

Conifers - Use cool underburns to control fuel loading and maintain structure in areas managed for large conifer attributes.

Benefits of fire:

- Increase the vigor of desirable forage plants.
 - Stimulate regrowth of desirable plants by removing top growth.
 - Ash releases nutrients to the soil, thereby stimulating regrowth.
 - Control noxious weeds that occupy the habitat of more desirable plants and may be injurious to wildlife, recreationists and/or livestock.
 - Control woody species encroachment on grasslands. Keep grasslands and oak savannahs in open condition except in those areas designated for shrub production.
 - Rejuvenate oak woodlands with the reintroduction of fire.
 - Establish forage plots to provide quality forage for CWTB.
- **Control noxious weeds in the NBHMA. Control methods include: biological, cultural, mechanical, burning, and chemical.**

Biological

Biological controls have been introduced on widespread well established Noxious Weeds- Italian thistle, Canada thistle, bull thistle, milk thistle, yellow starthistle, tansy ragwort, Scotch broom, St. Johnswort. Impacts- Reduce the spread of noxious weeds. Reduces degradation caused by weeds and reduces habitat invasion by weeds.

Cultural

After treatment, reseed upland communities with native perennial grasses collected on site. Perennial grasses help to restore proper functioning condition to uplands. Replace medusahead with desirable annual legumes like subterranean clover and lana vetch.

Mowing along roads and trails to reduce vegetation and noxious weeds. Mowing can be limited by slope, obstruction, and soil moisture constraints.

Burning

Controlled burning to reduce thatch, reduce noxious weeds, stimulate forb and perennial grass production in grasslands. Use to reduce conifer encroachment, reduce oak interspecies competition, and stimulate oak woodlands, savannah/woodlands.

Mechanical

Mechanical pulling or cutting of noxious and undesirable vegetation. Target species include:

- | | |
|------------------------|--------------------------|
| Noxious weeds | - Scotch broom, thistles |
| Undesirable vegetation | - Hawthorne |
| | - Himalayan Blackberry |
| | - Conifer seedlings |

Chemical

Fertilization may be used to help establish seedlings, to increase palatability of forage plants, particularly annual grasses, and increase the competitive ability of perennial grasses and forbs, to enable them to compete with noxious weeds.

Herbicides would be used only on priority sites of noxious weeds. Currently, the only herbicide use on the NBHMA is on two sites of yellow starthistle. Both sites are approximately 1/10 acre in size. Treatment of these areas prevents degradation of hundreds of acres of grassland habitat. Herbicide may be used on Canada thistle, especially where it threatens special status plant habitat or in preparation for forage plot development. Biological, mechanical, and manual treatments of Canada thistle, typically result in an increase of the weed. Plots of medusahead may be subject to a variety of treatments, including small scale herbicide application. Additionally, herbicide may be used to control and eradicate new invasions or infestations of high priority noxious weeds that are not currently known on NBHMA. Herbicide application would be in compliance with the mitigation measures in the Northwest Area Noxious Weed Control Program EIS (1985 and supplement 1987) and The Integrated Weed Control Plan and EA (1995). Herbicides would only be handled and applied by trained and certified personnel.

• Establish forage plots to provide quality forage for CWTD.

Forage plots (MA 19) would be created by plowing, discing, seeding, or planting. Site characteristics of forage plot locations are limited by topography, equipment access, and soil moisture. Sites with good soil moisture, high fertility and a well prepared seed beds would provide the maximum opportunity for seeding success. In general these sites would be in bottom lands. Buffer strips would be left between the plots and streams to minimize soil movement and sediment in streams. Small plots or strips generally 1/4 to two acres of nutritious, palatable plants would be seeded to provide quality forage for CWTD. Areas suitable for forage plots are shown in figure 2. Potential species that could be planted include:

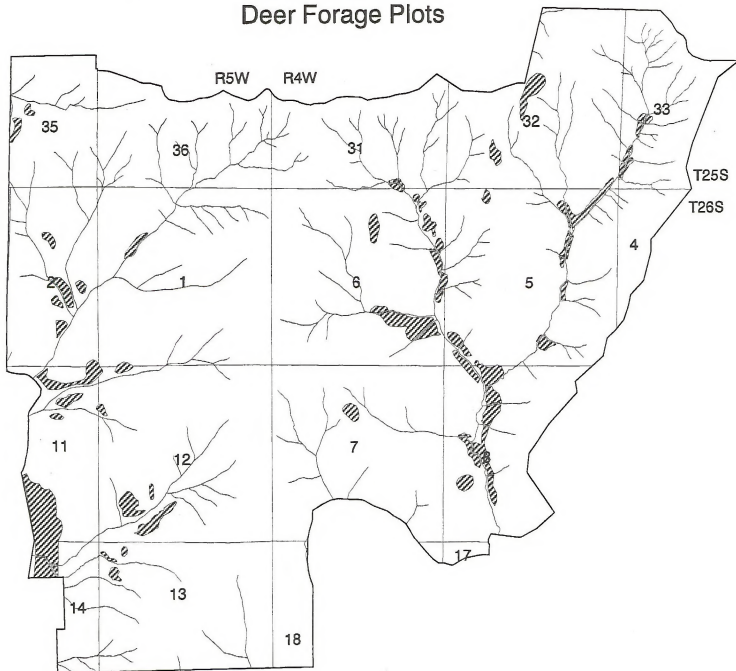
- | | |
|--------------------|---|
| subclovers | woodrose |
| alfalfa | fruit trees (apples, pears, plums etc.) |
| white clover | deerbrush |
| smallheaded clover | ceanothus |
| vetch | |

Rationale: Provide areas of high quality forage for CWTD. Necropsies of CWTD have shown low fat reserves suggesting lack of forage or poor forage quality.

Figure 2

North Bank Habitat Management Area

Deer Forage Plots



Legend

 Potential Deer Forage Plots

 Streams

Scale 1:37000
0.5 0 0.5 1 Miles



Information used for this map was produced using GIS from the North Bank Watershed Analysis

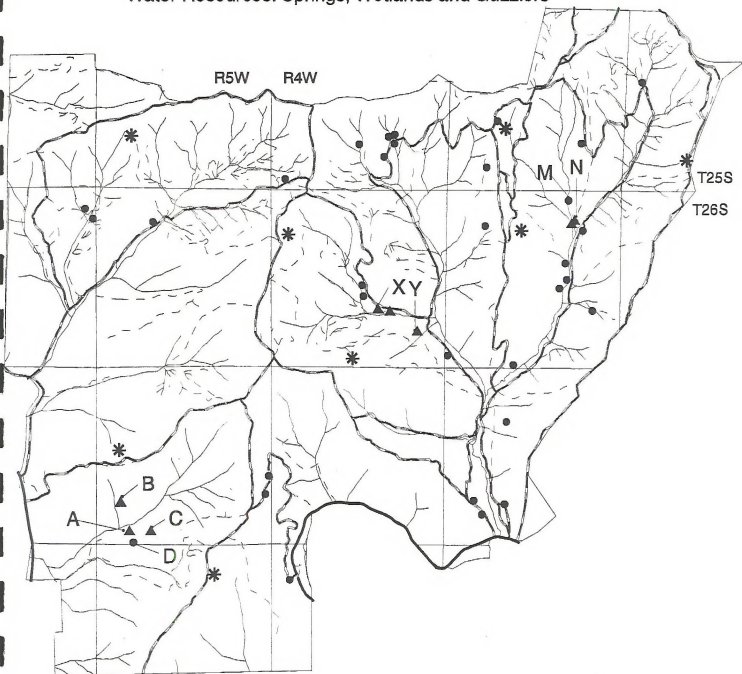
- Develop approximately 20 water developments that are well distributed across the management area.
- Develop at least one water impoundment with associated wetland in each drainage. Select potential water impoundment sites in each drainage that would maximize water storage potential, allow development of associated shallow water wetlands and enhance potential to restore flows to stream systems. Create earth berm type water impoundments in selected sites in each drainage. Water impoundments would store water through the dry periods, maintain succulent vegetation, help to maintain or restore summer flows to streams and maintain a source of water for wildlife. If adverse impacts to water impoundment sites or vegetation are occurring due to livestock and recreation use, fence all or a portion of the water development or pipe water away to a trough outside of the water impoundment area. **Rationale:** Development of water resources and associated habitat is critical to enhancing conditions on the management area for CWTB. At present, habitats associated with wetland or riparian vegetation appear to be the most desirable for CWTB. Research (in preparation) suggest that vegetation associated with water influenced habitats, and possibly the availability of water is a key element in CWTB use of various habitats. This is especially true in the hot summer months when most of the upland vegetation has become rank and dry and little water is available on the management area (MA 12). Preliminary results from research on home range and habitat utilization also indicates that CWTB does maintain a fairly small home range (Black, personal conversation). Thus, increasing the distribution of available water and creating areas with succulent vegetation should increase the carrying capacity of the management area for CWTB, increase the health and survivability of deer, and serve to increase the distribution of the deer population across the area. Well distributed water sources outside of stream riparian areas would also result in better distribution and utilization of forage areas by livestock used for grazing treatments. Water sources in the uplands would benefit wildlife, grazing management, and support equestrian and other recreation use. Water developments would also enhance the management area for many other species of plants and wildlife other than CWTB. Depending on type and size of water development, species from red-legged frogs, to waterfowl and bats may benefit from well distributed permanent water sources.
- Develop existing spring sites on the mid to upper slope areas to furnish open water and enhance potential for water associated vegetation. Sites and proposed developments would be reviewed by an ID Team prior to activity.
 - Excavate impoundment sites that have previously been developed but may have silted in. When possible, pipe water away to troughs or other structures from spring sites. Fence development site with deer friendly fencing if impacts due to grazing management become evident.
 - Divert water from free flowing springs to water holding structure for storage, availability to wildlife, and/or creation of areas with water associated vegetation prior to flowing off site.

- Maintain and enhance existing spring development that currently furnishes domestic water to the host site and office. Enhance riparian area created by overflow for watchable wildlife site near house.
- Install buried spring boxes or other collection structure in suitable spring sites and pipe water to adjacent holding structures to make water available to wildlife and increase desirable vegetation.
- If situations are suitable, design road prisms to enhance spring areas to create wetland areas and/or standing water.
- Restore, create, and/or expand existing wetlands to benefit wildlife and sensitive plant species.
 - Create wetland areas through use of construction methods in selected sites (see figure 3). Design projects to slow or capture runoff, create suitable wetland habitat for wildlife and sensitive plants, and allow increased infiltration of water into the soil profile. Wetlands would help in restoration of stream flows.
 - Use road maintenance projects to enhance existing wetlands or create new wetland areas when feasible.
- Install Guzzlers (rainwater collection devices) on ridge top areas that are lacking water resources. Install approximately six guzzlers distributed across the management area. Select ridge top sites that are accessible by vehicle so that installations may be used for fire management purposes or refilled by tanker if needed to maintain water availability. Installations would benefit wildlife utilizing the driest portions of the management area and would be available for use by equestrian users during the summer months.
- **Manipulate Vegetation Types to enhance or increase habitat for CWTD.** Use combinations of management methods to change existing habitats and/or enhance habitat(s) to increase suitability for CWTD (MA 13 through 15). Based on preliminary research results, some habitat types on the NBHMA, such as conifer or thick mixed hardwood/conifer types, have been shown to have little value for CWTD. It is possible to change existing habitats into areas more suitable for CWTD and to enhance currently occupied habitat. Changes to selected habitat types would be based on findings from current research on habitat use and forage selection. **Rationale:** Manipulation of vegetation is the primary technique to manage CWTD habitat. Increasing quality forage, cover, and desirable vegetative types would allow deer fitness (health) to improve and may increase the carrying capacity of the habitat for CWTD.

Figure 3

North Bank Habitat Management Area

Water Resources: Springs, Wetlands and Guzzlers



Legend

- ▲ Wetlands
- Springs
- * Guzzlers
- ~ Streams
- Roads
- - - Trails
- County Road

Scale 1:37000

0.5 0 0.5 1 Miles



Information used for this map was produced using GIS from the North Bank Watershed Analysis

- **Fertilization of selected areas to improve forage quality and quantity.**

Fertilization would be used to promote growth of desirable species (MA 12). Where annuals and noxious weeds are replaced with more desirable species, fertilizer could be used to give the desirable species an advantage. Application method would be broadcast aerially, by tractor, by ATV, or by hand. Where aerial application is used, streams and wetlands would be buffered by 100 feet. Where fertilizers are applied by tractor, ATV, or hand; streams and wetlands would be buffered by 25 feet. Type of fertilizer and application rates would be determined by soil testing and consulting the County Extension Service. **Rationale:** Fertilizers would be used to give a boost to desirable species. Fertilizer would increase growth and palatability of forage thereby increasing the quality and quantity of forage available to CWTD.

Objective #2

Manage selective habitat for other Special Status Animals.

Management Actions

- **Managing selected habitats for Special Status Species**

In many instances, management for CWTD would enhance or maintain habitats for other Special Status Species (SSP) (EIS, Appendix 1) that depend on that common habitat type. For other SSP it is possible to manipulate existing habitats to increase the fitness for those species. Examples include manipulation of selected conifer stands to encourage structural attributes that may favor animals such as bats or raptors that need large trees for roosting or nesting (MA 17). Increasing water storage around springs could enhance habitat for red-legged frogs and other amphibians. Conversion of conifer habitats into hardwood cover types could benefit many species of neotropical birds. **Rationale:** Although the primary emphasis for the NBHMA is to manage for CWTD, other species present are classed as sensitive species by the State or Oregon or other entities. It is possible to manage habitats for many of these other species without adversely impacting management for CWTD. By maintaining much of the plant and animal diversity or increasing the potential for greater diversity within the management area, the values for which the area was designated ACEC are enhanced.

- **Provide artificial structures for Special Status Animals.**

Use artificial structures such as nest boxes, nest platforms, perch poles, water impoundments and bat boxes and structures to enhance existing habitats for SSP (MA 20). **Rationale:** In many areas, the lack of one key element in the habitat may not allow SSP to occupy that habitat type. By artificially creating the missing element, it may be possible to make that habitat suitable for selected species. For example, placement of nest boxes within or adjacent to grassland areas may make the area suitable for Western Bluebirds or Purple Martin. Erection of perch poles will enhance grasslands for hunting by raptors, both day and night. Bats will benefit from roosting structures that are placed in suitable habitat or on existing buildings. Water impoundment creation can benefit western pond turtles and several species of amphibians and waterfowl.

Objective #3

Manage habitat for Special Status Plants.

Management Actions

- Increase the numbers of individuals in populations of red root yampah and Hitchcock's blue-eyed grass in yampah flats and shrubby rockcress at rockcress point by 25% over the ten year life of the plan (MA 11).
 - Prescribe burn yampah flats every three to five years in late summer or fall.
 - Plant seeds and vegetative material (such as tubers, rhizomes, seedlings) in suitable habitat at a frequency of no less than every other year until 25% increase is achieved.
- Establish population of popcorn flower in suitable wetland habitat in T26S, R4W, Sec. 6 after water development projects have been completed.
 - Remove competitive vegetation prior to introduction.
 - Plant vegetative material and/or seed in accordance with methods developed by Oregon Department of Agriculture.

Rationale: Increase the numbers of individuals in the population to make the population less susceptible to decline.

Issue 2. Recreational Use and Facility Development

Objective #4

Develop basic support facilities which support public recreation use on the NBHMA. Manage recreation uses including hiking, mountain biking, horseback riding, wildlife observation, primitive camping, environmental education, hunting, or uses of a similar nature.

Management Actions

- **Maintain a network of access roads and trails** throughout the NBHMA for public users in conformance with BLM trail maintenance standards for trails. Additional construction of trails would be done as needed to route non-motorized users around sensitive areas, avoid safety hazards, or complete a recreation trail loop. Dilapidated stream crossings would be replaced. Support facilities at parking areas should meet ADA standards, however, the majority of roads and trails throughout the NBHMA would not be disabled accessible (MA 1 and 2).
- **Pullout Parking** - Five locations along County Road 200 would be provided with gravel parking in an enlarged pull-off area. Pullouts which are a safety hazard due to location would be decommissioned. Overnight camping in self contained RV would be allowed (MA3). **Rationale:** Provide safe pull offs and reasonable access to public lands.

- **Main Barn** The present barn structure has been determined to be unsuitable for public use. A facility would be developed at this site to include gravel parking for ten vehicles with trailers, a group shelter (30' x 40') to accommodate 50 people, several picnic tables, double vault toilet, BBQ grill, information board with visitor register, manure bin, and an entrance gate which may be locked at night by the NBHMA host. Camping in self contained units would be allowed at the Main Barn site. Vehicles may be left unattended overnight for those engaged in primitive camping or other similar activities; i.e., hunting. This and the other facilities would be compliant to ADA standards for Americans with disabilities, as appropriate (MA 5). **Rationale:** Promote user safety and provide trail head facilities for access to the NBHMA.
- **West Entrance** - Facilities would include surfaced parking with 10 single parking spots and two sites for vehicles with a trailer, a single vault toilet, information board with visitor register, and barrier fence around the parking lot. Day-use activities would be allowed and unattended vehicles may be left for those engaged in night-time activities. This site would not be gated (MA 6). **Rationale:** Provide trail head facilities for a major access point to the NBHMA.
- **Doc's Landing** - Improvements would include surfaced parking for three vehicles and two with boat trailers, a single vault toilet, concrete boat ramp for river access, and two picnic tables. This site would be designed for day-use activities only and would not be gated (MA 7). **Rationale:** Provide access and facilities for river recreational use as well as a water source for the Glide Rural Fire Department and Douglas Forest Protection Agency for home and wildfire suppression.
- **Watchable wildlife sites** - Sites would be developed with interpretive signs, blind, or benches at observation overlooks (MA 8). **Rationale:** Public education.

Objective #5

Manage recreation uses to protect the natural resources, promote user safety, and minimize user conflicts.

Management Actions

- **Public Use** - Natural resources would be protected through nonmotorized use and limiting the amount of facility development to the three areas identified. The numbers of users would be limited through the size of facilities such as parking. Signs at road or trail intersections with a corresponding map would be provided to encourage users to use established trails and roads. Loose dogs are not allowed on NBHMA between April 1 and August 31. Dogs must be on a leash during this time. Dogs used for specific purposes may be authorized by the Authorized Officer; i.e, host site, eye-seeing dog. Additional trails would be created when necessary to avoid sensitive areas. **Rationale:** Minimize harassment and stress to Columbia White Tail deer, particularly during fawning season.

User safety would be promoted by providing registers at the Main Barn and West Entrance with information on lengths of stay. Written materials with safety items would be included in handouts. The NBHMA would be closed when necessary if circumstances such as fire danger would require it. Additional trails would be created when necessary to avoid hazardous areas. **Rationale:** Insure the safety of recreationists.

User conflicts would be minimized by requiring applications for Special Recreation Permits (SRP) for group, commercial, or competitive events and approving them only after they have been determined to be consistent with the primary goal and NEPA requirements have been met. The number of people using the NBHMA would be limited by the number of parking sites at each parking area. Hunting is regulated by the Oregon Department of Fish and Wildlife and the area would be signed to inform users when special hunts are occurring (MA 4). **Rationale:** Insure all users can enjoy the NBHMA with minimal conflict with other users.

- **Primitive camping** - A register would be maintained at the Main Barn and West entrance. The "Leave No Trace" program would be emphasized for camping and implemented through signing, brochure handouts, and talking directly with public users on the NBHMA. Camping would be restricted within 50 feet of creeks and streams (MA 9). Seasonal restrictions on fire use would be determined by Douglas Fire Protective Association or the Authorized Officer. **Rationale:** Provide the public with a quality recreation experience without undue impact to the NBHMA's unique habitat.
- **Environmental Education** - This program would be provide brochures, tours, and possible display development on a variety of environmental topics (MA 10). Types of environmental education projects on the NBHMA include:
 1. Develop modules and guidebooks for educators that are based on resources available on the NBHMA.
 2. Provide basic facilities and access to areas suitable for environmental education.
 3. Modify existing sites to increase educational potentials if compatible or complementary with primary management goals of the NBHMA.
 4. Develop formal programs, based on NBHMA resources, utilizing local agency resource professionals to be used in educational outreach programs with local schools, e.g. Hydrology, Fisheries, Forestry, soils, etc.
 5. Develop partnerships with local schools and colleges to continue development of the environmental education opportunities present on the management area.
 6. Invite other agencies such as the National Resource Conservation Service (NRCS) to participate in and utilize reclamation/restoration projects as demonstration areas for local landowners.

Rationale: Provide a method of educating the public about the natural resources of the NBHMA.

Issue 3: Water Quality / Quantity

Objective #6

Improve current water quality and quantity through repair of roads and trails (see figure 4).

Management Actions

- **Upgrade eroding road segments.** - A road inventory of nearly 40 miles of road was conducted during September 1999. The purpose of this inventory was to assess the conditions of the existing road network, prioritize problem areas for upgrade and recommend site-specific and objective-specific projects. The inventory data was analyzed and road segments prioritized based on the weighted, combined score of the five separate inventory elements – water diversions, dysfunctional drainage, mass wasting, rutting, and presence of wet areas. These five elements are the most important factors affecting the Key Issues as expressed in the WA. The results of the cumulative prioritization analysis for the Top-10 out of 42 road segments are as follows:

TABLE 2: Priority for Road Repair

Priority	Road Segment	Miles	Total Score
1	26-5-11.1A	0.47	41
2	26-4-8.1B	2.54	40
3	26-4-8.2	0.76	39
4	26-4-8.0B	3.58	37
5	26-5-2.1	0.72	36
6	26-5-11.1B	1.68	34
7	25-4-32.3	0.08	26
8	26-4-8.0	0.73	25
9	26-4-8.4B	1.04	25
10	26-4-7.0	0.24	24

Typical design features for correction:

- * water diversions - Install driveable water bars and outslope road surface.
- * dysfunctional drainages - Install higher capacity culverts, reinforce inlet basins and harden culvert outlets.
- * mass wasting - Construct rip rap buttresses and retaining structures.
- * rutting - Blade, shape and outslope road surfaces.
- * wet areas - Reinforce road subgrade with geofabric and rock.

Rationale: Repair of roads would reduce sedimentation to streams and modify peak flows which would improve water quality and moderate quantity.

- **Design roads for low maintenance.** The road inventory revealed neglected road maintenance. Ultimate objectives for the transportation system (roads and trails) in the NBHMA should be:

- To have a minimum width road and trail network (roads that are outspoled, no ditchline, waterbarred, and few culverts).
- To have transportation system that is "invisible" to the erosional and hydrologic processes, and have a road system that is low maintenance.

Motorized use would be restricted to personnel performing official duties, conducting fire fighting, or emergency activities. Use of highway vehicles on maintained roads is seasonally limited to avoid damage to roads. Generally, year round ATV access would be allowed unless excessive disturbance to the road surface occurs. Road and trail segments that show sign of damage would have seasonal restrictions place on them or be closed. **Rationale:** Full implementation of the above Objective would reduce the need for maintenance to a great extent. The full implementation may take 10 to 20 years. In the interim, a partial implementation, specifically eliminating water diversions, would help to reduce maintenance needs by an estimated 60%. When combined with seasonal vehicle access restrictions, the total maintenance needs could be reduced by 75% to 80%.

- Reconstruct and upgrade problem sites. Ten problem sites were identified during field reconnaissance. These sites pose either a threat to public safety, or contribute substantially to environmental degradation. They are all associated with roads in the area. The location of the sites is presented on Figure 4 "NBHMA Problem Areas". These sites should be reconstructed as soon as practical.

TABLE 3: Road Problem Areas

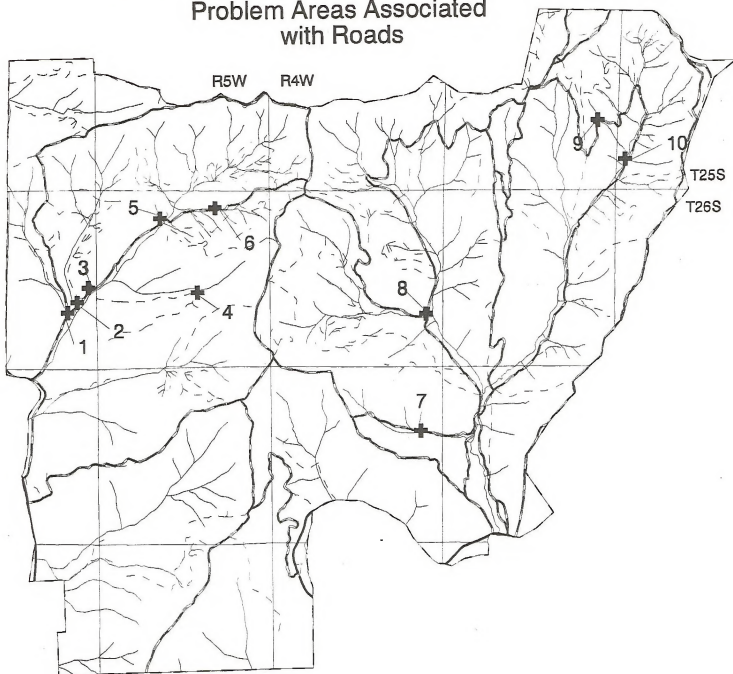
Site No.	Problem	Fix
1	Stream Crossing Failure & Stream Diversion	Construct a reinforced, low water ford.
2	Stream Crossing – Deficient Bridge	Rock fill with drainage structure designed for fish passage.
3	Stream Crossing – Deficient Bridge	Rock fill with drainage structure designed for fish passage.
4	Road Slide Stabilization	Stabilizing the failing road fill with a rip rap buttress.
5	Degraded Stream Crossing	Reinforce the fill with rock buttresses and replacing old culvert.
6	Heavily Gullied Road Segment – 200 feet	Fill gullies with rip rap rock.
7	Heavily Gullied Road Segment – 0.7 miles	Fill gullies with rip rap rock.
8	Stream Crossing Erosion	Reinforce the stream crossing with rock buttresses.
9	Fill Failure at Stream Crossing	Reinforce the stream crossing with rock buttresses.
10	Fill Failure in Landslide Area	Reinforce the stream crossing with rock buttresses.

Rationale: Repair stream crossings and stabilize road surfaces to provide safe access to the area (particularly to the Chasm Creek drainage), reduce sedimentation to streams, and modify peak flows; thereby improving water quality and moderate quantity.






Figure 4

North Bank Habitat Management Area

Problem Areas Associated with Roads



Legend

-  Problem Areas Associated with Roads
-  Streams
-  Roads
-  County Road
-  Trails

Scale 1:37000
0.5 0 0.5 1 Miles



Information used for this map was produced using GIS from the North Bank Watershed Analysis

Issue 4: Riparian / Wetland Habitat

The priority of stream rehabilitation would be:

1. Jackson Creek Drainage
2. Chasm Creek Drainage
3. White-tail Drainage

Objective # 7

Arrest degradation of at-risk stream segments.

Management Actions

The rehabilitation action would consist of placing structures such as large wood or rock buttresses below the headcuts. A headcut is an erosional process in streams. **Rationale:** Reduce the erosion and downcutting within the stream channel. This would also reduce sediment transport downstream.

Objective #8

Rehabilitate stream banks and channels.

Management Actions

Rehabilitate stream segments based on the conditions of stream bank, bank height, and site accessibility. The rehabilitation would include: channel widening, resloping of unvegetated stream banks, and planting stream banks with trees. **Rationale:** Channel widening and resloping stream banks would allow streams to develop a meander. This would slow the velocity of flow reducing erosion and sediment transport. Planting trees along streams would provide large roots, in the future, to stabilize the stream channels.

Objective #9

Aggrade stream channels.

Management Actions

The rehabilitation would include: construction of rock or wooden grade control structures. Placing large wood or rock in the stream channel would add structure and roughness to the channels. This would armor the channel, catch sediment, and result in decreasing the gradient of the channel. **Rationale:** Decreasing of the stream gradient by constructing grade control structures has several benefits for the stream environment:

- Reducing the velocity of stream flow.
- Reducing the erosive power of the stream flow.
- Increasing sediment deposition.
- Increasing the base flow in the streams.
- Improving the stability of the stream banks.

MONITORING

Monitoring of these management actions would be done at appropriate intervals to evaluate if the goals and objectives of this plan is being met. In addition to monitoring, several studies are either in progress at this time or are proposed. These studies are in cooperation with the Oregon Department of Fish and Wildlife.

Issue 1: Columbian White-tailed Deer and Special Status Species

Objective #1 - Manage vegetation to provide habitat, forage quality, and quantity for CWTD.

Grazing - Results of various treatments, improvements to habitat and other impacts from grazing will be monitored on a watershed basis. Monitoring would include 1). stubble height measurements to determine timing of livestock grazing, 2). photo plots to visually assess vegetative changes, 3). percent composition of species present by cover class to determine increases in native species, perennial grasses and deer forage species and 4). designated comparison plots in areas where grazing or other treatments have not been conducted. Monitoring and utilization plots would be placed in key areas. Stubble height measurements would be taken periodically while livestock were present. Photo and cover plots would be monitored at least once each year, at approximately the same date each year.

Fertilization, grazing, burning, and forage plots - Erosion on treated land would be periodically monitored and erosion rates estimated based on visual observations. Natural Resource Conservation Service's soil loss tolerance values would be used as guideline for acceptable erosion rates.

Objective #2 - Manage selective habitat for other Special Status Animals.

Monitoring will be developed and conducted as needed.

Objective #3 - Manage habitat for Special Status Plants.

Monitor populations of red root yampah, Hitchcock's blue-eyed grass, and shrubby rockcress to detect a 25% change in population numbers over a five year period. Collect data annually using randomly placed plots or by completing a comprehensive census.

Monitor introduced population of popcorn flower to detect a 25% change in population numbers over a five year period using the number of plants initially introduced as a baseline. Collect data annually using randomly placed plots.

Issue 2: Recreational Use and Facility Development

Objective #4 Develop basic support facilities which support public recreation use.

1. NBHMA host would conduct vehicle counts, contact and provide information to visitors, resolve simple visitor problems, collect and maintain register information site, and report any other incidents, violations or problems to the authorized officer's representative. Registers provide information about size of party, home town, type of activities engaged in, length of stay, opportunity for comment, or more. Registers would also provide information on campers who are overdue. Notification may be made with users home or County Search and Rescue personnel.

2. BLM employee observations and contacts would be made on a regular basis in the field, including monitoring and implementing the Leave No Trace program.

Objective #5 Manage recreation use to protect the natural resources, promote user safety, and minimize user conflicts.

The recreation planner, field manager, and/or safety officer would conduct an annual assessment to determine if these objectives are being met. If not, measures would be taken to resolve recreation management in affected areas by imposing restrictions as appropriate.

Issue 3: Water Quality / Quantity

Objective #6 Improve current water quality and quantity through repair of roads and trails.

Monitoring of the above management actions would consist of periodic inspection and reporting as required or needed. All roads would be inspected on a yearly basis. Federal and state personnel conducting official business on the NBHMA would be encouraged to report new problems and notable downward trends in road and trail conditions. Conditions which pose substantial risks to safety and the environment would be dealt with expeditiously. Other rehabilitation work would be scheduled into an annual maintenance program.

Issue 4: Riparian / Wetland Habitat

Monitoring would be accomplished by site inspections, and by establishing photo points that would indicate the rate and degree of success. Annual monitoring would include:

1. Establishing permanent cross sections on response reaches in Jackson, Chasm, and Whitetail Creeks.
2. Monitor the vegetation response to management.
3. Record precipitation, air and water temperature, and instream flow.
4. Evaluate Fisheries population response to management actions.
5. Establish photo points for monitoring of all instream and riparian work

Research Studies on the NBHMA

1. CWTD habitat use, home range, distribution, and fawn survival

This project has been completed and is in draft (Ricca, 1999). The project researched CWTD life history parameters within the Roseburg population of CWTD and re-examined data collected and analyzed by Smith, 1981. Several biological and ecological (habitat, residential housing density, etc.) parameters have changed since Smith's study and current information indicates differences between the two studies. The project helped to provide baseline data on which to spring-board additional management oriented research and substantiated the State's decision to de-list CWTD. Fawn survival became an issue when trapping efforts resulted in almost no fawn captures, even though this age group is highly susceptible to the trapping technique. Three years of data on fawns have substantiated high fawn mortality and poor recruitment into the population.

2. CWTD Genetics

Previous data had been collected on the genetics, but new genetic analytical techniques allow further exploration of common questions regarding "genetic purity" (are black-tailed deer inter-breeding with CWTD?) and "relatedness" (are CWTD just geographically isolated Idaho white-tailed stock?). Initial results do show that CWTD are genetically pure (no signs of black-tailed deer genes) but a disturbing result is the population's lack of genetic diversity. Collection of blood samples for genetic testing is ongoing throughout the range of the Roseburg population of CWTD, including those on the NBHMA.

3. CWTD and Columbian Black-tailed Deer (CBTD) interactions

This research study has been completed and is in preparation (Whitney, 1999). CWTD population densities and "available habitat" should have allowed the population to expand beyond the distribution documented by Smith (1981), but survey work has shown little change in distribution. Also, deer radio-marked in Smith's project have shown almost no dispersal type movements (behavior that would be expected especially by yearling males in high densities). Research in other White-tailed deer populations has shown that white-tailed deer normally are more competitive in situations with other deer species where their ranges are sympatric. The question is, "what is limiting the expansion of CWTD into habitats that appear available?" Could it be competition with CBTD, either through direct physical aggression or through resource partitioning? Are the two species competing for limited forage? The project is designed to research these questions.

4. Monitoring of CBTD on NBHMA

With current research on the NBHMA, information has been gathered on CWTD, but little on CBTD. To adequately evaluate the effect management of the NBHMA has on the resident deer population, similar data on habitat use, home range and survival rates of CBTD is needed. In that regard, starting fall 1997, CBTD have been captured, radio-marked and monitored. Research is ongoing.

5. CWTD - CBTD population manipulations

The primary goal for NBHMA is to provide optimal CWTD habitat, which should help increase populations. Thus, depending on the results of the above research, there will be a need to manipulate and monitor the vegetative components and/or the deer populations. For example, results of the above studies may find competition between the deer species and suggest that CBTD are suppressing CWTD populations. To test the suppression, CBTD harvest could be increased on the NBHMA and changes in CWTD populations would be monitored.

6. NBHMA habitat manipulations

Based on the results of the projects listed above, Alternative C would manipulate habitat on the NBHMA to optimize CWTD habitat. Manipulations would seek to increase the quality and quantity of preferred habitat. These habitat changes should allow CWTD populations to increase. To test whether or not habitat manipulations have a positive impact, CWTD populations need to be monitored. This would be a long-term project requiring population monitoring, vegetation management and deer proof fencing (to test treated versus untreated areas). The study would need to be maintained for a minimum of five years.

7. Wildlife Diversity Surveys

With the large number of species of special concern on the NBHMA, most project would require a pre-project survey to document the presence or absence of these species. The surveys could either be done on a project by project basis, or a survey/sample of the entire area could be conducted for each animal group (birds, reptiles, amphibians, mammals) to document their total distribution on the NBHMA. This could be linked with the GIS habitat map for a more comprehensive understanding of the area's wildlife diversity. Bird surveys could be conducted by using specific sample blocks, point counts, transects, drift nets, or recordings. Reptiles and amphibians could be surveyed by using drift nets, pit traps, funnel traps, or audible surveys (frogs and toads). Mammals could be sampled by using techniques such as live traps, pit traps, snap traps (if necessary), scent stations, aerial or ground observation, nets (for bats), or sensor-camera photographs.

COST ESTIMATES AND IMPLEMENTATION SCHEDULE

This section outlines the purpose of various projects and their associated costs. Projects are not listed in order of priority and no implementation schedule has been established. Some projects are likely to be funded by outside sources or grants. Cost estimates are based on 1997 prices.

Objective #1 - Manage vegetation to provide habitat, forage quality and quantity for CWTD.

1. Grazing

The potential exists for partnership arrangements for exchange of service between the BLM and contractors. No cost estimates have been established.

2. Burning

Controlled fire is a very useful tool in controlling succession, reducing the threat of catastrophic fire, and enhancing forage quality. Fire figures prominently in managing the grassland, oak savannah, oak woodland, and the brush field areas of the NBHMA. Costs are inversely related to the amount of area to be burned at any one time. Burning costs can be broken down into two components -- actual burning costs and the costs of constructing control lines.

1. Burning costs range from \$8-16/acre and includes crew costs for ignition, burning, and mop-up. Mop-up costs is the driving factor here; with heavier fuel types requiring more mop-up. A ten person crew working eight hours would total approximately \$1,600.
2. The cost of constructing control lines range from \$0.20 to \$1.20 depending upon the methods employed
 - a. Handline \$0.60/foot
 - b. Cat \$1.20/foot with a \$500.00 move-in cost
 - c. Foam \$0.20/foot

Rehabilitation of the control lines (waterbarring, seeding, mulching) could be accomplished using the fire crew.

With control lines in place, an experienced crew could easily burn several thousand acres in a two-three day period.

3. Noxious Weed Inventory, Monitoring, and Control

Integrated pest management techniques would be used to initiate eradication of all Oregon List A noxious weeds within one year of discovery. Integrated pest management would be applied to Oregon List B noxious weeds as necessary to control infestations. Mechanical, manual, chemical, and biological methods may be applied to high use areas such as parking lots, roadways, and recreation sites. The introduction or redistribution of biological control agents would be the primary method of control for List B weed control. Treatments would be monitored to determine effectiveness. Inventories would be conducted in areas where new infestations of both List A and B weeds are suspected. Cost: \$10,000/year.

4. Forage Plots

The preferred alternative calls for planting up to 250 acres of dispersed forage plots. Costs can be broken down into two main groups--mechanical contracts and supplies.

1. Mechanical preparation costs average \$140.00 - 200.00/acre (includes cultivation, seeding, and fertilizing).
2. Supplies
Seed and fertilizer costs estimated at \$100-125/ac.

5. Water Development

Water impoundments

Create open water impoundments in lowland areas of the management area. Use excavation in areas of saturation to create potholes. Surface of potholes would be at grade of surrounding landform. Construct berm/dam type water impoundments in areas to collect overland runoff or water directed from road systems. Use cross channel/in channel dams/structures to collect sediment, raise water table, create open water areas.

A. Approximate costs for pothole development in saturated areas:

Potholes: approximate cost assuming access for heavy equipment, multiple excavations in selected areas: Large backhoe or excavator, approximately \$104/hour; 2 dump trucks, plus operators, \$120/hour; and move-in costs, \$600/move. For example, one excavation could equal 20 foot x 20 foot x 6 foot deep = 88 cubic yards of material removed from the site. Estimated time per pothole after setup would be two hours. Assume could do three potholes in the general vicinity per day without additional moves. Total cost would equal: \$624/excavator + \$720/dump trucks + move in at \$650. Divided by three potholes in the same vicinity, the cost would be \$665 per pothole. Additional sites would require transport and moving costs to new locations.

B. Approximate costs for off channel, berm type water impoundments construction:

Water Impoundments: costs include engineering required at site, clearance, permits, and actual construction. Costs highly variable due to site differences, project size. Costs based on estimates furnished by Douglas County Soil Conservation District. Median cost for average size pond, approximately \$40,000. Range \$10,000 --\$60,000.

C. Approximate costs for cross channel structures:

Cross channel installation: costs are highly variable due to type, site, size of installation and engineering required to design structure(s). Cost based on estimates furnished by Douglas County Soil Conservation District. Range of costs for "hard" installations, \$500 -- \$10,000. Small projects such as installation of brush bundles or small sills to capture silt could be accomplished at little cost with volunteer labor and donated materials, (Christmas trees). Cross channel structures would be designed to capture bedload to aggregate streambeds in order to raise water tables, allow vegetation to establish and stabilize streambeds.

Seeps & Springs

Develop existing springs/seeps to furnish free water sources. Install collection systems to divert water to storage tanks for dry season availability. Installations could be similar to guzzlers with storage tanks and drinking troughs/fountains suitable for wildlife. Developments would be installed using both hand labor and heavy equipment at suitable sites.

Spring developments: Storage tank cost \$750 -- \$1,600; Springbox, \$250; Miscellaneous hardware, water line, perf pipe, drain rock, \$350; Labor, \$500; Heavy equipment with operator, \$350; Total cost for installation, approximately, \$2,200 -- \$3,050.

Water catchment, storage type guzzlers

Guzzler types are dependent on soil depth and access to selected sites. Above ground installations are used in shallow soil areas to reduce the need to use explosives or large heavy equipment for excavation. Installations should be visually non-intrusive. Below ground storage tanks would be used where soil depth is adequate to bury tanks with heavy equipment and access is adequate for materials and equipment. All installations would need to be fire resistant due to potential burning for habitat manipulation/maintenance.

- A. Approximate costs, estimated: above ground installation, 2,000 gallon + capacity;
Pre-fabricated guzzler, parabolic type: unit cost approximately \$4,000; Labor for installation approximately \$500 (volunteers may be used for installation of this type); Equipment, (backhoe, etc.) approximately \$200/unit, if needed. Total/unit approximately \$4700.

Component type guzzler: Storage tank cost \$750 to \$1,600; Collection apron, metal supports, approximately \$300; Miscellaneous parts and water line, approximately \$200; Labor for installation, approximately \$600; Equipment use/unit approximately \$350. Total approximate cost, \$2,300 -- \$3,150/installation. (Assuming suitable access to site)

- B. Approximate costs, estimated, below ground installation, 2,000 gallon + capacity;
Component type guzzler: Storage tank cost \$750 to \$1,600; Collection apron, metal supports, approximately \$300; Miscellaneous parts and water line, approximately \$200; Labor for installation, approximately \$750; Equipment use/unit approximately \$600. Total approximate cost, \$2,600 -- \$3,450/installation. (Assuming suitable access to site, suitable soil depth, no use of explosives)

Project Maintenance

Maintenance and inspection of various water developments would be required throughout the life of each installation. Costs involved would include work months required for maintenance and inspection, replacement of components, and potential repair of damaged developments. In the case of guzzlers, inspections and routine maintenance would be required at least two times yearly. With ponds, inspections may be required after each storm event that is significant enough to have an effect on the structure. Work would also be required on each installation prior to habitat burning in order to prevent damage to structures. Cost projections do not anticipate significant damage to installations or potential modifications that may be required in the future.

Anticipated annual costs include: work months, .75 wm's @ \$4,000/ WM; materials and supplies, replacement parts, \$1,250; heavy equipment, \$500. Annual total maintenance costs, Approximately \$4,750. Average cost per installation, approximately, \$240.

6. Timber Management

Precommercial thinning (PCT) of trees or the suppression of competing brush/undesirable species would be used to accomplish this. Costs for PCT and brushing average \$150.00/ac. If it becomes necessary to plant conifers on the 400 acres allocated for timber production, planting costs run \$135/ac. (400 tpa). And seedling costs run \$150/M.

7. Fertilization

Estimated cost of \$12 - 15 /ac. for fertilizer and application. Costs vary by technique, application rates, and target species.

Objective #2 - Manage selective habitat for other Special Status Animals.

Costs associated with management are unknown at this time.

Objective #3 - Manage habitat for Special Status Plants.

1. Special Status Plant Assessments

Both quantitative and qualitative monitoring would be conducted on Special Status Plant locations. Quantitative monitoring would be conducted at Special Status Plant locations where enhancement management has been implemented and where experimental populations have been established. Cost: \$4,000/year.

2. Special Status Plant Enhancement and Establishment

Enhancement management would be conducted on red root yampah habitat to increase the amount of occupied habitat in the Yampah Flats and Whitetail Creek watersheds. Enhancement management would be conducted on Hitchcock's blue-eyed grass habitat to increase the amount of occupied habitat in the Yampah Flats and Chasm Creek watersheds. At least one experimental population of red root yampah and Hitchcock's blue-eyed grass and two experimental populations of popcorn flower would be established in unoccupied, suitable habitat. Cost: \$12,000/year.

Cost Estimates

Prescribed Burning:	\$8-16 per acre
Population Enhancement:	\$2,500 per species, \$7,500 total
Population Introduction:	\$12,000
Monitoring:	\$5,000 per year

Objective #4 Develop basic support facilities which support public recreation use.

Recreation Facility Cost Estimates:

Main barn complex:

Gravel parking area for vehicles & trailers	\$10,000
Manure bin	1,000
Double vault toilet	25,000
Picnic tables (5)	1,800
Information board	700
Fencing, gate	<u>2,000</u>
	40,500

West entrance:

Gravel parking area for vehicles & trailers	5,000
Single vault toilet	13,000
Information board	1,000
Fencing, gate	<u>2,500</u>
	21,500

Doc's Landing:

Gravel parking area	3,000
Single vault toilet	13,000
Information board	1,000
Concrete Boat ramp, rip/rap	<u>125,000</u>
	142,000

Pullout Parking areas along Cty. Road 200: 3,500

TOTAL \$ 207,500

(1997 dollar estimates, overhead costs not included.)

Visual Resources Cost Estimates:

The BLM's Visual Resource Management system (VRM) provides a systematic approach to the management of aesthetic resources on public lands. The VRM system provides for inventory of existing scenic quality and assignment of visual resource inventory (VRI) categories based on a combination of scenic values, viewing distance zones, and visual sensitivity. Four visual resource classes have been established to serve two purposes: (1) provide an inventory tool to portray the relative value of existing visual resources, and (2) provide a management tool for portraying visual management objectives. To manage the quality of the NBHMA's visual environment and reduce the visual impacts of development/management activities, a visual resource inventory should be completed within one year of the completion of the EA and Habitat Management Plan.

Objective #5 Manage recreation uses to protect the natural resources, promote user safety and minimize user conflicts.

Environmental Education

Costs:

Projected cost estimates for developing and maintaining educational programs around resources available on the management area have no basis for comparison at this time. Projected costs identified in this document are based on estimates of work months needed to initiate preliminary scoping for an educational program. Costs for individual projects would be identified during the initial scoping phase of project initiation. Continuation of educational opportunities would depend on annual funding to maintain or continue programs over time.

1. Initial scoping, coordination and development of cost estimates for objectives: six work months at \$4,000/wm = \$24,000 for project initiation costs.

2. Annual costs for coordination and continued development of educational programs (includes field assistance for educators). Estimated at three work months at \$4,000/wm = \$12,000 annual personnel costs.

Total costs for full implementation over time would depend on the type of project, resources necessary to develop, annual resource utilization by institutions and amount of costs that can be offset by use of volunteers or donations. Initiation of an environmental education program on the NBHMA would be dependent on the approved Habitat Management Plan and funding. Continuation of an environmental education program once initiated, would be dependent upon support and use by the community and adequate funding.

Objective #6 Improve current water quality and quantity through repair of roads and trails.

These costs would be approximately

Objective #7 Arrest degradation of at-risk stream segments.

The rehabilitation action would consist of reinforcing, rock buttresses below the head cuts. Cost of stabilization of the headcuts is estimated at \$1,000 to \$1,200 each.

Objective #8 Rehabilitate stream banks and channels.

Rehabilitate stream segments based on the conditions of stream bank, bank height and site accessibility. This segment is approximately 500 feet long. Cost of the project is estimated at \$6,000 to \$8,000.

Objective #9 Aggrade stream channels.

The rehabilitation action would include: construction of rock or wood grade control structures. The project costs would depend on site-specific situations, but would probably range between \$500 and \$1,500 each.

Cultural Resources

Public education - Continue use of site 35DO61 for public education. This would take the form of continuing excavations at site 35DO61, using volunteers from the community, as well as professionals. Providing public tours of the excavation in progress is an additional opportunity. The development of an interpretive display at the NBHMA house could compliment onsite work. Estimated cost are approximately \$25,000/year to support excavation efforts.

Inventory - Complete a cultural inventory of all management area lands. Estimated time period for completion is approximately five years. Estimated costs are approximately \$6,000/year X 5 years = \$30,000.

Project clearance - Inventory all proposed ground disturbing project sites for cultural resources. Mitigate sites if required. Estimated inventory costs are approximately \$1,000/year. If need for mitigation arises, costs would depend upon the magnitude of mitigation. No estimates for mitigation costs are available.

Studies

1. CWTD habitat use, home range, distribution and fawn survival

Funded. Field work completed, work in draft form.

2. CWTD genetics

Partially funded, ongoing cooperative research with USFWS and ODFW.

Cost for technician work months estimated at \$2,000/month for 8 months. This would also allow one more year of fawn capture/monitoring and monitoring of radio-collared CBTD and CWTD on the management area in concert with the genetics study.

3. CWTD and Columbian Black-tailed Deer interactions

Field work completed and funded. Analysis in preparation, completion projected for 6/2000

4. Monitoring of CBTD on NBHMA

See #2, above, CWTD Genetics

5. CWTD - CBTD population manipulations

This study would entail frequent population level monitoring and surveys requiring support for FLIR (or similar) helicopter flights. It would also require regulation changes to increase CBTD harvest. A technician would be required to continue monitoring of the previously marked CWTD and monitor changes in habitat use patterns, survival, and dispersal. A rapid change in CWTD populations should occur upon being "released" from CBTD suppression. Two year study.

Cost:

Graduate student (2 years):	\$30,000
Transmitters (60):	\$18,000
Technician (2 years):	\$48,000
2 Vehicles (1 years):	\$24,000

6. NBHMA habitat manipulations

Cost:

Deer proof fence:	\$8,000/mile
Graduate student:	\$15,000/year
Technician:	\$24,000/year
Vehicle:	\$12,000/year
Vegetation Manipulation:	Vegetation Management Section

7. Wildlife Diversity Surveys

Equipment costs would vary by the type and extent of the survey. Most costs would involve personnel and vehicle expenses.

PLAN EVALUATION

This plan is written to cover a period of ten years. It will be evaluated annually to determine if objectives are being met and the reason for any objectives not being met. Annual monitoring will be summarized and management will be evaluated to determine if additional actions are needed to meet the objectives.



